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Illinois Department of Transportation

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TRAFFIC CONTROL FIELD MANUAL

FOR IDOT EMPLOYEES



Illinois Department
of Transportation

Bureau of Safety Programs & Engineering

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Illinois Department of Transportation
Bureau of Safety Programs and Engineering

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I. Introduction

This Manual is issued for the purpose of the proper application of temporary traffic control devices for all employees of the Illinois Department of Transportation (IDOT) working on or near open traffic lanes. Work Zone Cases have been developed to establish the minimum requirements for work site protection, when traffic control is provided by the Department. IDOT employees providing inspection for contract work, permit work, or utility work shall work within the traffic control provided by the Contractor, Permit Holder, or Utility Company. Traffic control and work site protection measures for contracted work, permit work, or utility work shall be in accordance with the contract documents, permit documents, or the applicable IDOT Highway Standards for Traffic Control. Since Work Zone Cases call for the minimum requirements, additional devices should be added when necessary to enhance safety. These Work Zone Cases shall not replace traffic control highway standards placed within a contract or traffic control plan.

This Manual does not apply to Emergency Traffic Patrol (ETP) and Emergency Patrol Vehicles (EPV) personnel. Snow and ice control workers, EPV workers, and ETP workers requirements are covered by IDOT's Safety Code. Workers other than IDOT personnel using this Manual for reference shall be aware that this Manual is not a substitute for training of personnel whose actions affect traffic control and the safety of the public. Contractors or their authorized agents shall follow Illinois Law with regard to flaggers (430 ILCS 105/2) which states -- "At all times during which men are working where one-way traffic is utilized, the contractor or his authorized agent in charge of such construction will be required to furnish no fewer than 2 flagmen...".

For two-lane, two-way roadways, contractors or their authorized agents shall either use a case that requires two (2) flaggers or modify a case that allows the use of one (1) flagger to two (2) flaggers. Only employees or officials of the State or public agencies engaged in construction or maintenance may use one (1) flagger to control traffic on a two-lane roadway where allowed.

The proper use and most effective placement of traffic control devices are required to prevent injury to employees and the public. Planning should be a high priority so that work can proceed in a safe, efficient, and orderly manner with minimal interference to motorists. Each Work Zone Case herein has been developed to meet the requirements of the "Manual on Uniform Traffic Control Devices for Streets and Highways, Part 6."

These cases and the traffic control included in the contract or permit documents establish minimum requirements which will provide a reasonable level of safety. Application of these requirements cannot, however, guarantee the safety of every worksite. Each worker and supervisor should, therefore, be alert for any circumstance which could require change, including the application of additional devices. When specific operations are not covered, a TCP should be developed for the special application. Each employee is responsible and should review the traffic control to ensure the safety of the employees and the motorists. Deficiencies shall be corrected. For work operations expected to be in place for more than three (3) days, a TCP shall be developed and approved by the District.

II. Definitions

Advance Warning Area - that part of a Temporary Traffic Control (TTC) zone used to inform the motorist what to expect ahead. This area may contain anywhere from a single sign or a rotating/strobe light on a vehicle to a series of signs and the use of a portable changeable message sign (PCMS)/Message Boards.

Advance Warning Sign Spacing - the distance between signs or between a sign and some other location or device within the TTC zone. It is determined by the posted speed limit. This will ensure that the motorist has sufficient time to read the signs and react accordingly. Typical Advance Warning Sign Spacings are included in the TTC Distance Charts.

Advisory Speed - the recommended speed for all vehicles operating on a section of highway and based on the highway design, operating characteristics, and conditions. Advisory speeds are not enforceable.

Approach Sight Distance - the distance which a motorist can visually identify the flagger station, a lane closure, a slow moving or stopped vehicle, or any other situation which requires adjustments by the motorist.

Average Daily Traffic (ADT) - Average Daily Traffic volumes. Use most recent ADTs posted on IDOT's website.

Bi-directional Left Turn Lane - that part of the roadway that has a continuous bi-directional left turn lane located between the opposing lanes of traffic. This design variation may be found on either two-lane, two-way roads or multilane roads.

Buffer Area - an area between the lane closure taper and the work area that provides a recovery space for an errant vehicle and is free of equipment, workers, material and vehicles.

Crashworthy - is a characteristic of roadside devices that have been successfully crash tested in accordance with the National Cooperative Highway Research Program (NCHRP) Report 350, "Recommended Procedures for the Safety Performance Evaluation of Highway Features" or Manual for Assessing Safety Hardware (MASH).

Decision Sight Distance - the total distance traveled during the length of time required for a driver to:

- detect an unexpected or otherwise difficult-to-perceive information source or hazard in a roadway environment that may be visually cluttered,
- recognize the hazard or its potential threat,
- select an appropriate speed and path, and
- initiate and complete the required maneuver safely and efficiently.

The decision sight distance is used to determine the minimum advance warning distance to the furthest and/or single sign. When determining minimum sight distance to flaggers and mobile operations, these distances also apply.

Divided Road - a highway or two roadways where opposing traffic is separated by a median (ditch, barrier, curbing, etc.). Temporary traffic control for divided multilane roads may be also used for one-way roadways.

Downstream Taper - the taper at the end of the activity area which guides traffic back into its original lane. When used, this taper should be 50 to 100 ft with a 20 ft spacing between channelizing devices.

Duration - the length of time traffic is disrupted. The following are defined in overlapping intervals since TTC layouts for longer durations may always be used for shorter durations, especially when roadway attributes such as traffic volume and speed, and the work area location may warrant higher levels of traffic control.

- **Brief Encroachment** - for non-emergency daylight operations where workers and/or equipment are in or within two (2) feet of the traveled lane less than 15 minutes. When a non-emergency operation stays in one location during daylight conditions for less than 15 minutes.
- **Intermittent/ Moving Operation** - operations that stop briefly then move on and operations that are continuously moving; when an operation is continuously moving or stopped in one location for periods of 15 minutes or less. The traffic control devices are typically vehicle-mounted. The work area should change by at least the decision sight distance for it to be considered a change in location.
- **Short Term** - when an operation stays in one location during non-emergency daylight conditions from 15 to 60 minutes, such that minimal TTC devices are deployed.

- **Intermediate Term** - when an operation stays in one location from greater than one (1) hour to no more than three (3) days. Advance signing and larger channelizing devices are required.
- **Long Term** - when an operation stays in one location for more than three (3) days. A project specific Traffic Control Plan is required. Contact with the District is required.

Engineering Judgment - the evaluation of available pertinent information, and the application of appropriate principles, standards, guidance, and practices as contained in this Manual and other sources, for the purpose of deciding upon the applicability, design, operation, or installation of a traffic control device.

Expressway - any multilane, divided highway for through traffic with partial control of access and generally with at-grade intersections.

Freeway - any divided highway with full control of access (i.e. has interchanges, ramps, and no at-grade intersections).

High Speed Road - a roadway where the posted speed limit is 45 miles per hour or greater.

Highway - a general term for denoting a public way for the purposes of vehicular travel, including the entire area within the right-of-way.

Lane Closure - a closure of one or more lanes of the roadway to traffic. Generally, a minimum lane width of 10 ft is required for a traffic operation. Work operations that restrict adjacent lane width should consider various lane closure alternatives depending upon volume and speeds on the roadway.

Lateral Buffer Space - the space that separates the traffic space from the work area. It is typically the extra space provided between traffic and workers, excavations, pavement edge drop-offs, or an opposing lane of traffic. Traffic lanes may be closed to provide for lateral buffer space. See the Drop-off Guidelines of this Manual for more information.

Low Speed Road - a roadway where the posted speed limit is 40 mph or less.

May - This word, or the adjective "OPTIONAL," means that an item is truly discretionary.

Merging Taper - the taper used on a multilane road to close a lane and combine its traffic from that of the adjacent lane. Its length is dependent on the posted speed of the roadway. Higher speeds require a longer distance for traffic to merge lanes. Typical merging tapers are included in the TTC Distance Charts.

Message Boards - refer to Portable Changeable Message Signs (PCMS) definition.

Motorist - an operator of a motorized vehicle intended to be used on a roadway.

Multilane Road - a roadway where two (2) or more lanes of traffic travel in the same direction. A multilane road may be classified as either undivided or divided.

Off Shoulder - a work area located primarily off the shoulder, or which causes little or no restrictions on the use of the shoulder. This work area should have little or no interference with traffic such that traffic speeds generally are not reduced.

Portable Changeable Message Sign (PCMS) - a sign either trailer-mounted or vehicle-mounted that is capable of displaying more than one message, changeable by remote or automatic control.

Posted Speed Limit - the speed limit determined by law and shown on Speed Limit signs. It is used in this Manual's charts to determine the spacing of TTC devices and the lengths of various tapers on the TTC Layouts.

Protective Vehicle - the vehicle that is placed in advance of the work area and equipment to block errant vehicles from entering the work area. The purpose of a protective vehicle is to protect workers, equipment, and the motorists. When a protective vehicle is required on a Work Zone Case, a truck mounted attenuator and an arrow board are required unless the protective vehicle is entirely on the shoulder.

Road, Roadway - that portion of a highway improved, designed , or ordinarily used for vehicular travel and parking lanes, but exclusive of the sidewalk, berm, or shoulder even though such sidewalk, berm, or shoulder is used by persons riding bicycles or other human-powered vehicles.

Roll-Ahead Distance - the recommended minimum distance between a protective vehicle with truck mounted attenuator and the work area. A protective vehicle may be used in a moving operation to provide extra safety for the workers. Appropriate roll-ahead distances are shown in Work Zone Cases and on page 43.

Rural Highway - a highway where traffic is normally characterized by lower volume, higher speed, fewer turning conflicts and fewer conflicts with pedestrians.

Shadow Vehicle - the vehicle placed in advance of the work area to provide advance warning to motorists. The spacing in advance of the protective vehicle should be as shown in Work Zone Cases.

Shall -This word, or the term "REQUIRED," means that the definition is an absolute requirement.

Shifting Taper - the taper used to move traffic from the traffic lane onto a bypass or shoulder. This traffic maneuver generally requires half the distance of a merging taper. See the TTC Distance Charts for the length of a shifting taper called L/2.

Should - This word, a statement of recommended, but not mandatory, practice in typical situations, with deviations allowed if engineering judgment or engineering study indicates the deviation to be appropriate.

Shoulder Closure - a closure of the roadway shoulder for work operations. The shoulder then becomes unusable by traffic for vehicle maneuvers or break-downs. TTC layouts for work operations using or on a shoulder are dependent on the type of shoulder usage and duration.

Shoulder Taper - the taper used to close the shoulder off to traffic so that shoulder work can be done or equipment can be placed on the shoulder. Since this taper is used to guide errant traffic back to its normal lane path, it does not require a full merge distance. The taper length is reduced to one third (1/3) of a merging taper length. See the TTC Distance Charts for the length of a shoulder closure taper called L/3.

Spotter - A trained worker whose sole duty is to monitor traffic and warn co-workers of errant drivers or other hazards.

Temporary Traffic Control (TTC) Plan - a plan describing the traffic controls to be used for facilitating vehicle and pedestrian movements through a temporary traffic control zone.

Temporary Traffic Control (TTC) Zone - an area of a highway where road user conditions are changed because of a work zone or incident by the use of temporary traffic control devices, flaggers, uniformed law enforcement officers, or other authorized personnel. See Areas in Work Zone.

Termination Area - that part of a TTC zone located beyond the work area which guides traffic back into its normal traffic path. A longitudinal buffer space may be used between the end of the work area and the beginning of the downstream taper.

Traffic Control Device - a sign, signal, marking, or other device used to regulate, warn, or guide traffic, placed on, over, or adjacent to a street, highway, pedestrian facility, or shared-use path by authority of a public agency having jurisdiction.

Traffic Space - that part of the roadway open to traffic that is next to the activity area. Traffic routing is provided with channelizing devices. For a description of the various types of channelizing devices and their general uses, see the Temporary Traffic Control Devices Section of this Manual.

Transition Area - that part of the TTC zone that moves the traffic from its normal path or lane into the traffic space. This movement of traffic is done through the use of channelizing devices and directional signing placed in various types of tapers.

Traveled Lane - the portion of the roadway for the movement of vehicles, exclusive of the shoulders, berms and sidewalks.

Turn Lane Closure - the closure of a right or left turn lane for work operations. Signing in the TTC zone shall provide adequate warning to the motorists and provide an alternative turning maneuver. Layouts from the various roadway types should be reviewed for the best alternate depending upon roadway intersection design, traffic control (stop, yield, signals, etc.), speed limit, and volume.

Two-Lane, Two-Way Road - a roadway consisting of two (2) opposing lanes of undivided traffic.

Two-Way Taper - the taper used on two-lane, two-way road to change the road into a single lane of two-way traffic. It is primarily used for flagging operations and other traffic control situations. It is typically 100 ft in length and contains six (6) equally spaced channelizing devices.

Undivided Road - a roadway where opposing traffic lanes have no physical separation barriers except pavement markings (where required).

Urban Street - a type of street normally characterized by relatively low speed, wide ranges of traffic volumes, narrower lanes, frequent intersections and driveways, significant pedestrian traffic, and more businesses and houses.

Volume - the number of vehicles passing a given point on the roadway or, the Average Daily Traffic (ADT).

Work Area - that portion of the roadway or shoulder that is closed to the traffic and set aside for workers, equipment, work vehicles, and materials. It may be stationary or moving. The space requirements for a specific TTC Zone will determine the type of TTC layout that is appropriate for the project. The layout will specify the appropriate sign locations, flagger stations and tapers depending on the type of work space.

Work Vehicle - the vehicle that is placed in advance of the work area and equipment to block errant motorists from entering the work area.

Work Zone Speed Limits - a regulatory speed limit in a temporary traffic control zone.

III. Temporary Traffic Control Devices

General Guidelines

For approved temporary traffic control (TTC) devices, refer to the IDOT website, contract documents, Work Zone Cases or Permit documents.

All TTC devices should be placed in the order that drivers will see them, starting with the sign or device that is farthest from the work area, placing the others as the work area is approached. Removal of TTC devices should be done in the reverse order or under Work Zone Cases WZ 21 or WZ 40 for moving operations. A common exception to this practice is the placement and removal of detour signing and TTC devices. Detour signing and TTC devices should be erected from the end of the detour and continue to the beginning of the detour. Detour signing removal should be in the reverse order, removing signs in the direction of traffic flow.

All vehicles, equipment, workers (except flaggers) and their activities are restricted at all times to one side of the pavement, with the following exceptions:

- When authorized by their supervisor or the applicable Work Zone Case
- For brief encroachments, where site conditions do not allow vehicles to be parked completely out of the traveled way

At locations where all vehicles, equipment, workers or their activities are more than 15 ft from the edge of pavement, no traffic control devices are required.

All equipment, trucks, and materials should be parked on the shoulder and downstream from the protective vehicle. If at all possible, lane closure tapers and the buffer area should be kept free of any materials, equipment, or workers, except as shown herein on applicable Work Zone Cases.

Workers should not be farther than 200 ft downstream of the protective vehicle or work vehicle.

Signs that do not apply to current conditions such as WORKERS and/or FLAGGER shall be removed, covered, or turned from the view of motorists.

The following pages describe some of the most frequently used traffic control devices. For these devices to perform successfully they shall be of good quality, their placement shall be proper and their position shall be maintained. All devices should be periodically evaluated using the Quality Standard for Work Zone Traffic Control Devices in this Manual.

Distances stated in this Manual are guides. Field conditions may force adjustments to maximize visibility of flaggers and signs in some work zones. In general, small increases in distance are acceptable. Decreases in distance should only be used for unique situations where an increase in distance will not work.

The flagger station shall be lit during non-daylight hours. In addition, consideration should be given to illuminating the work site. Special attention should be given to assuring that auxiliary lights/floodlights do not create a disabling glare for the motorists.

Channelizing Devices

The function of channelizing devices is to delineate a desired vehicle path, mark specific hazards on or near the roadway, separate opposing traffic flows and partially or totally close the roadway.

Channelizing devices include cones, drums, barricades and various kinds of markers.

At night, reflectorized cones, drums, or barricades shall be utilized. If cones are used at nighttime, retroreflective collars are required and workers shall be present to maintain the devices.

Sandbags may only be used on the lower barricade rails. Striped panels facing traffic shall not be covered. Weights of concrete, stone or other materials shall not be used. Sandbags shall not be added to self-ballasting barricades.

Barricades are to be placed so that the stripes slant downward toward the side on which traffic is to pass.

Warning Lights

Special attention should be given to assure maximum sign retroreflectivity and that lighting of devices is operational. Steady burn lights shall be used on barricades and drums when these devices are used for delineation of the traveled way. Flashing lights shall be used to mark obstructions and hazards.

Warning lights on devices shall be placed on the side which traffic is to pass.

Vehicle Strobe/Warning Lights

Strobe/warning lights on work vehicles utilized by the Contractor, Permit Holder or Utility Company are addressed in the contract documents, permit documents, and/or the IDOT Highway Standards for Traffic Control. Vehicle strobe/warning lights shall be a system which supplements vehicle hazard lights. These strobe/warning light systems should have visibility from all directions. Vehicle hazard lights are not considered vehicle strobe/warning lights. The remainder of this section addresses vehicles owned or leased by the Department and utilized by its employees.

When vehicles are located on or within 15 ft of the pavement edge, vehicular mounted strobe/warning lights will be utilized. This requirement includes all vehicles parked on the shoulder. Revolving lights are adequate for tractors, while non-truck mounted equipment is exempt, i.e. air compressors, asphalt kettles, etc.

Revolving lights on existing vehicles may be utilized until the vehicle is replaced.

Illinois law allows the use of amber/white lights only when engaged in work operations.

Exception: Unoccupied vehicles, such as vans or pickups with equipment needed for the current work activity, parked in a closed lane as support vehicles. The lane shall be closed in accordance with the applicable Work Zone Case. This would apply to those work activities which exceed 60 minutes. The protective vehicles and actual work vehicles, such as a lift, asphalt truck, drill rig, etc. shall have their strobe/warning lights operating.

High Visibility Clothing (Personal Protective Equipment)

High visibility clothing requirements for the Contractor, Permit Holder or Utility Company are addressed in the contract documents, permit documents, or the Standard Specifications for Road and Bridge Construction. The remainder of this section addresses high visibility clothing requirements for IDOT employees.

All employees on foot, excluding flaggers, within the highway right-of-way shall wear Department-approved high-visibility safety apparel in accordance with the Department Employee Safety Code.

IDOT flaggers shall be equipped with Department-approved high-visibility safety apparel in accordance with the Flaggers' Guide in this Manual.

Visibility during non-daylight hours is sharply reduced. As a minimum, all employees assigned to work in open traffic lanes at night shall wear Department-approved high-visibility safety apparel in accordance with Department Employee Safety Code.

See "Flaggers' Guide" in this Manual for flagging requirements.

Work Zone Signing

All advance warning signs shall be removed, covered, or turned to face away from traffic when they are no longer required or appropriate.

When work operations exceed four (4) days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. When approved by the District, temporary sign supports may be used where posts are impractical. When post mounting is not required, either temporary sign supports or sign trailers may be used.

Post mounted signs shall be a breakaway design. The sign shall be within five (5) degrees of vertical. Two (2) posts shall be used for signs greater than 16 sq ft in area or where the height between the sign and the ground exceeds 7 ft.

Signs on temporary supports shall be crashworthy. Documentation of meeting the requirements shall be the FHWA letter stating acceptance of the sign support system for the required test level. The signs shall be supported within 20 degrees of vertical.

Weights used to stabilize signs shall be attached to the sign support as per the manufacturer's specifications. Sign trailers, when erected, shall have their tires resting on the ground or elevated a maximum of 6 in. above the ground. Weights used to stabilize the trailer shall be sandbags mounted a maximum of 12 in. above the ground. To prevent wind induced rolling of the trailer, the wheels shall be chocked with sandbags or the trailer tongue may be pinned. The pinning method shall be designed to give way in the event of a vehicular impact and shall meet the approval of the District.

All warning signs shall be a minimum of 48 in. by 48 in., although signs on local roads may be a minimum of 36 in. by 36 in. (see contract documents). For signs mounted on trucks above truck-mounted attenuators and below arrow boards, 36 in. by 36 in. warning signs may be allowed in order to avoid obscuring the arrow board. For this application the sign shall be mounted in such a way that the bottom corner of the sign is completely visible above the truck-mounted attenuator and its top corner is at least 2 in. from any of the arrow board lamps or LEDs. Signs shall not be cut or have their diamond shape modified. Signs mounted on portable stands shall be no less than 12 in. above the traveled way. When warning signs are used on a paved surface, sandbags should be used to minimize movements. Signs shall be a minimum of 2 ft and a maximum of 10 ft from the edge of the pavement or face of curb. Placement should be adjusted to field position conditions so they are readily seen by motorists. Longitudinal dimensions for the placement of

signs may be increased up to 100 ft to avoid obstacles, hazards, or to improve sight distance. Spacing of signs should only be decreased when warranted by unique site conditions. The last sign in a series should be repeated 500 ft past major intersections and interchanges outside of urban areas.

"ROAD WORK AHEAD" and "ROAD CONSTRUCTION AHEAD" Signs

Work Zone Cases require "ROAD WORK AHEAD" signs. "ROAD CONSTRUCTION AHEAD" signs are required for Contractors, Permit Holders, and Utility Companies in accordance with contract documents, permit documents, and the applicable IDOT Highway Standards for Traffic Control.

"ROAD WORK AHEAD"/"ROAD CONSTRUCTION AHEAD" signs shall be erected on all side roads located within the limits of the mainline "ROAD WORK AHEAD" / "ROAD CONSTRUCTION AHEAD" signs.

"SURVEY CREW" Signs

For appropriate applications "SURVEY CREW" signs may be used in lieu of Workers (W21-1) signs.

Work Zone Speed Limit Signs

Work zone speed limit sign assemblies shall be provided and located as shown on the Work Zone Case, in the contract documents, permit documents, or traffic control plan. All permanent speed limit signs located within the work zone shall be removed or covered.

Two (2) additional assemblies shall be placed 500 ft beyond the last entrance ramp for each interchange or sideroad. Work zone speed limit signs shall not be installed on a vehicle.

Modifications of work zone speed limits shall be based on engineering judgment, and approved by the District in accordance with the Policy on Establishing and Posting Speed Limits on the State Highway System (speed limit policy). This may include replacing the existing regulatory speed limit with a work zone speed limit at the same speed, or reduction of 10 mph for existing speed limits of 65 mph or less and 15 mph for existing 70 mph speed limits. Justifications for reductions of work zone speed limits include:

- Workers are present in the closed lane adjacent to traffic; or
- Drop-offs next to open traffic lanes; or
- Weaves and/or temporary alignments

Optional work zone speed limit signs which match the existing regulatory speed may be used, except for the following Work Zone Cases (Each Work Zone Case will display optional work zone speed limit signs if allowed.):

- Moving / Intermittent Operations
- Work on Ramps
- Two-Lane Roadway with Lane Closure

Each Work Zone Case will display optional work zone speed limit signs if allowed.

When determining whether to install optional work zone speed limit signs where the work zone speed limit matches the existing regulatory speed limit the Districts shall reference Section D in the Policy on Establishing and Posting Speed Limits on the State Highway System (speed limit policy).

This work shall be coordinated with the lane closure(s) by promptly establishing a reduced posted speed zone when the lane closure(s) are put into effect and promptly reinstating the posted speed zone when the lane closure(s) are removed.

The work zone speed limit signs and End Work Zone Speed Limit sign shown in advance of and at the end of the lane closure(s) respectively shall be used for the entire duration of the closure(s). On multilane roadways having an existing, posted speed limit of greater than or equal to 45 mph, a 45 mph Work Zone Speed Limit shall be established through placement of work zone speed limit signs when workers are present in the closed lane adjacent to traffic and are not protected by temporary concrete barrier. The sign assemblies shown within the lane closure(s) will not be required when the worker(s) are located behind a temporary concrete barrier wall. This sign should only be used within a series of warning signs.

Contact the Bureau of Safety Programs and Engineering for the current fine amount.

**Work Zone Speed
Limit Assembly**



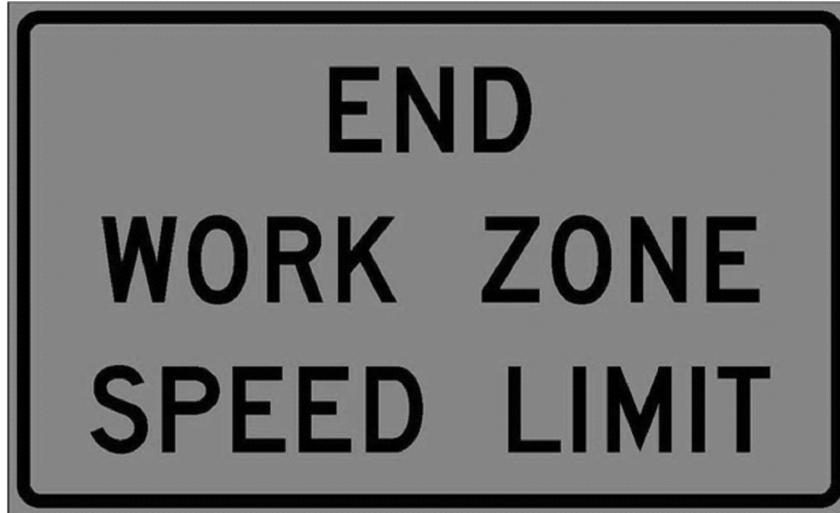
W21-I115

R2-1

R10-I108P

R2-I106P

G20-I103



IV. Guidelines for the Use of Portable Changeable Message Signs (PCMS)

The primary purpose of Portable Changeable Message Signs (PCMS) is to advise motorists of unexpected traffic and routing situations.

Portable Changeable Message Signs SHALL:

- 1) Be aimed at approaching traffic.
- 2) Be dimmed at night.
- 3) Be placed in advance of any hill crests or sharp corners that would limit visibility to approaching traffic.
- 4) Be disconnected from tow vehicles when in a single location for longer than two (2) hours.
(Tow vehicle shall be moved away so as not to be a hazard.)
- 5) Provide real time information to motorists on traffic conditions ahead. Be placed such that the bottom of the message sign is a minimum of 7 ft above the roadway in urban areas and a minimum of 5 ft above the roadway in rural areas.
- 6) Be placed according to manufacturers' recommendations, if applicable.

Messages

- Each message should consist of no more than two (2) phases and shall consist of no more than three (3) phases.
- A phase shall consist of no more than three (3) lines of text.
- Each phase shall be understood by itself regardless of the sequence in which it is read.
- An accurate description of the work location or the incident location is critical.
- The use of abbreviations is discouraged. The entire word should be spelled out whenever space permits.
- If abbreviations are used, they should be easily understood (see the following list of acceptable abbreviations and unacceptable abbreviations).

Abbreviations That Shall be Used Only on PCMS

Word Message	Standard Abbreviation	Prompt Word That Should Precede the Abbreviation	Prompt Word That Should Follow the Abbreviation
Access	ACCS	_____	Road
Ahead	AHD	Fog	_____
Blocked	BLKD	Lane	_____
Bridge	BR	[Name]	_____
Cannot	CANT	_____	_____
Center	CNTR	_____	Lane
Chemical	CHEM	_____	Spill
Condition	COND	Traffic	_____
Congested	CONG	Traffic	_____
Construction	CONST	_____	Ahead
Crossing	XING	_____	_____
Do Not	DONT	_____	_____
Downtown	DWNTN	_____	Traffic
Eastbound	E-BND	_____	_____
Emergency	EMER	_____	_____
Entrance, Enter	ENT	_____	_____

Abbreviations That Shall be Used Only on PCMS

Word Message	Standard Abbreviation	Prompt Word That Should Precede the Abbreviation	Prompt Word That Should Follow the Abbreviation
Exit	EX	Next	_____
Express	EXP	_____	Lane
Frontage	FRNTG	_____	Road
Hazardous	HAZ	_____	Driving
Highway-Rail Grade Crossing	RR XING	_____	_____
Interstate	I-	_____	[Number]
It is	ITS	_____	_____
Lane	LN	[Roadway]	_____
Left	LFT	_____	_____
Local	LOC	_____	Traffic
Lower	LWR	_____	Level
Maintenance	MAINT	_____	_____
Major	MAJ	_____	Accident
Minor	MNR	_____	Accident
Normal	NORM	_____	_____
Northbound	N-BND	_____	_____

Abbreviations That Shall be Used Only on PCMS

Word Message	Standard Abbreviation	Prompt Word That Should Precede the Abbreviation	Prompt Word That Should Follow the Abbreviation
Oversized	OVRSZ	_____	Load
Parking	PKING	_____	_____
Pavement	PVMT	Wet	_____
Prepare	PREP	_____	To Stop
Quality	QLTY	Air	_____
Right	RT	Keep, Next	_____
Right	RT	_____	Lane
Roadwork	RDWK	_____	Ahead, [Distance]
Route	RT, RTE	Best	_____
Service	SERV	_____	_____
Shoulder	SHLDR	_____	_____
Slippery	SLIP	_____	_____
Southbound	S-BND	_____	_____
Speed	SPD	_____	_____

Abbreviations That Shall be Used Only on PCMS

Word Message	Standard Abbreviation	Prompt Word That Should Precede the Abbreviation	Prompt Word That Should Follow the Abbreviation
State, county, or other non-US or non-Interstate numbered route	[Route Abbreviation determined by highway agency] *	_____	[Number]
Tires with Lugs	LUGS	_____	_____
Traffic	TRAF	_____	_____
Travelers	TRVLRS	_____	_____
Two-Wheeled Vehicles	CYCLES	_____	_____
Upper	UPR	_____	Level
Vehicle(s)	VEH, VEHS	_____	_____
Warning	WARN	_____	_____
Westbound	W-BND	_____	_____
Will Not	WONT	_____	_____

* A space and no dash shall be placed between the abbreviation and the number of the route.

Unacceptable Abbreviations on PCMS

Abbreviation	Intended Word	Common Misinterpretation
ACC	Accident	Access (Road)
CLRS	Clears	Colors
DLY	Delay	Daily
FDR	Feeder	Federal
L	Left	Lane (Merge)
LT	Light (Traffic)	Left
PARK	Parking	Park
POLL	Pollution (Index)	Poll
RED	Reduce	Red
STAD	Stadium	Standard
WRNG	Warning	Wrong

V. Guidelines for the Use of Flashing Arrow Boards (AB)

Flashing Arrow Boards (AB) SHALL:

- 1) Be "aimed" at approaching traffic.
- 2) Be dimmed when used at night.
- 3) Be used in the caution mode only for:
 - A) Work on roadway of two-lane, two-way roads;
 - B) Work on shoulder;
 - C) When closing a shoulder;
 - D) Roadside work close to the shoulder;
 - E) When parked in a closed lane beyond the taper.
- 4) Be placed in advance of any hill crests or sharp corners that would limit visibility to approaching traffic.
- 5) Be placed at or close to the start of the lane taper.
- 6) Be disconnected from tow vehicle when in a single location for longer than two (2) hours.
(Tow vehicle shall be moved so as not to be a hazard.)
- 7) Have yellow panels, if so equipped, closed when not in use.
- 8) Have yellow panels, if so equipped, match direction of flashing arrow.
- 9) Be placed according to manufacturers' recommendations, if applicable.

Only flashing arrow, flashing double arrow, and/or flashing caution displays shall be used.

Flashing arrow mode shall only be used in merging taper.

Note: When a truck mounted Arrow Board is utilized, it replaces an Arrow Board shown on the case drawing.

Arrow Boards shall comply with the following requirements.

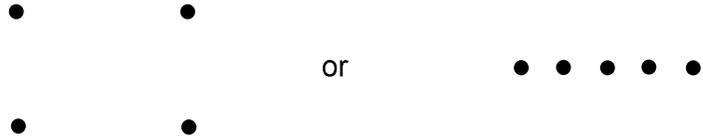
Any device not meeting these criteria may only be used as a supplemental device. An Arrow Board shall be rectangular in shape, be of solid construction, and be finished in non-reflective black.

Arrow Board Type		Minimum Size	Minimum Legibility Distance	Minimum Mounting Height (Above Pavement to Bottom of Board)
A	Truck Mounted	48 in. X 24 in.	$\frac{1}{2}$ mile	6 ft for speeds \leq 45 mph
B	Truck or Trailer Mounted	60 in. X 30 in.	$\frac{3}{4}$ mile	6 ft for all speeds but less than 24 hour duration
C	Truck or Trailer Mounted	96 in. X 48 in.	1 mile	7 ft for all speeds all lengths of time

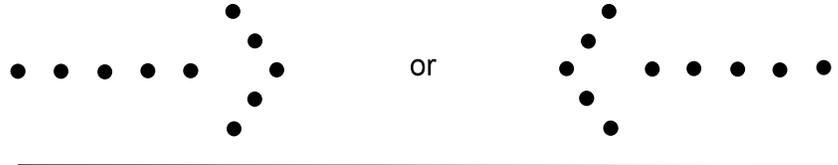
Proper Procedures

Panel Display

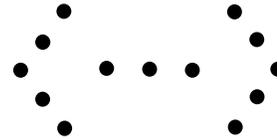
1) Two-lane two-way highway



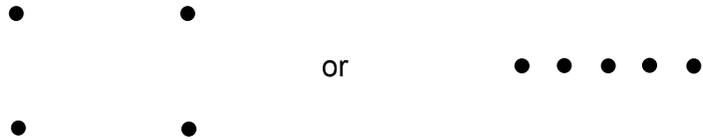
2) Multiple Lane Roadway



3) Merge right or left
(center lane closure)



4) Caution

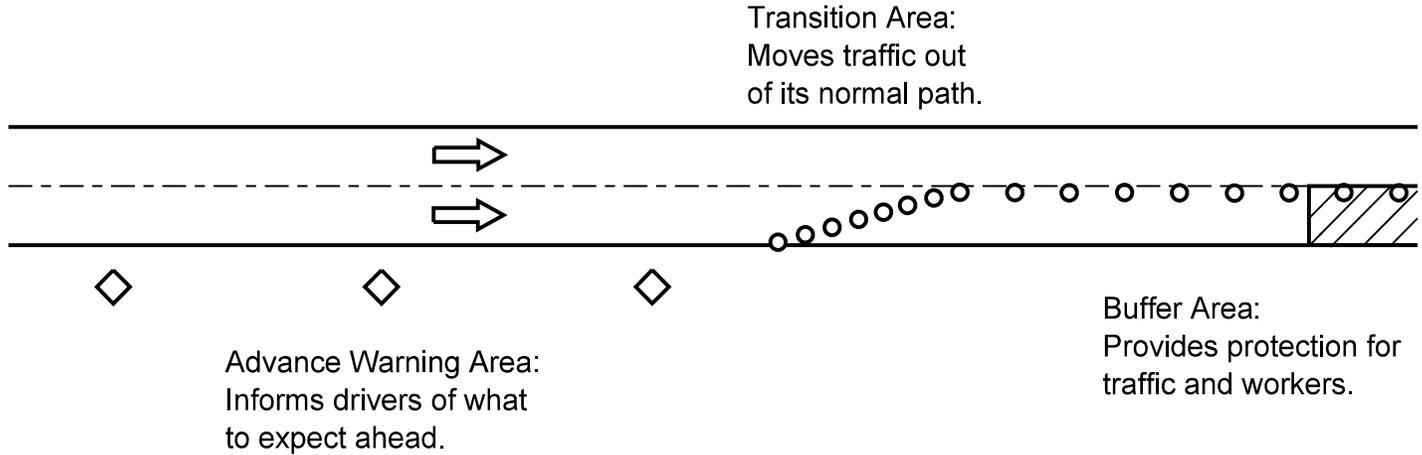


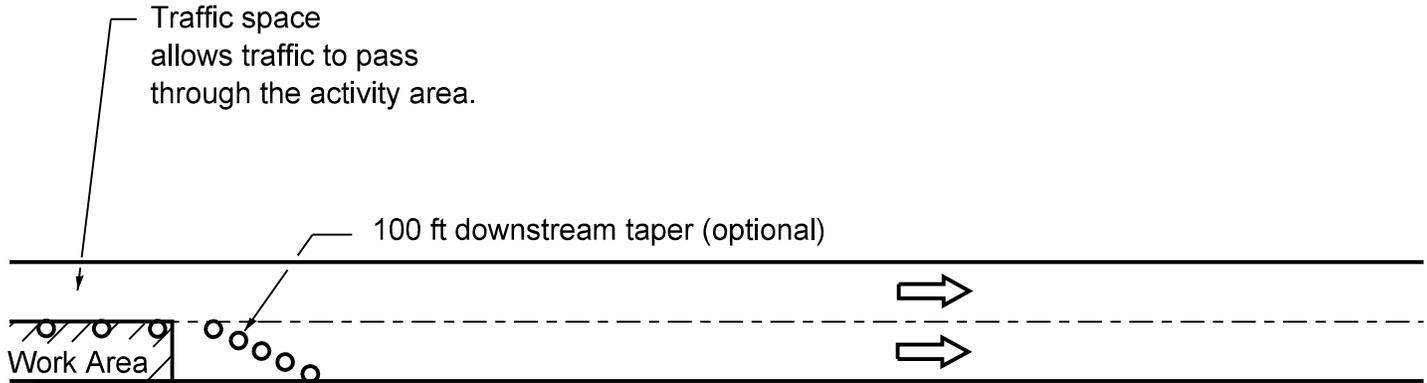
VI. Temporary Concrete Barrier

Temporary concrete barrier shall be identified as Illinois F Shape by stamp or paint. Temporary concrete barrier shall meet FHWA crashworthy standards for Category 3, Test Level 3 requirements. The barriers shall be seated on bare, clean pavement or paved shoulder and pinned together in a smooth, continuous line.

The barrier unit at each end of the installation shall be secured to the pavement or paved shoulder using six (6) anchoring pins and protected with an accepted crashworthy device of the specified Test Level as shown on the plans. Each approach end of the barrier shall be shielded with an approved crashworthy end treatment, regardless of placement within or outside the clear zone.

VII. Components of Work Zone Temporary Traffic Control





Work Area:
Set aside for workers, equipment, and material storage.

Termination Area:
Lets traffic resume normal driving.

VIII. Protective Vehicle with Truck Mounted Attenuators (TMA)

The purpose of a protective vehicle is to protect both the workers and the motorists. A truck mounted attenuator and an arrow board are not required when the protective vehicle is entirely on the shoulder. TMAs shall be utilized at locations shown on the cases.

Where the TMAs are labeled as optional, extra consideration should be given to the following:

- 1) Heavy truck volumes
- 2) Traffic volumes and speeds
- 3) Limited sight distance

When a TMA is not available and one is required, the activity shall be postponed until one is available. An Arrow Board is not an acceptable substitute for a TMA.

When required on a case drawing, a TMA shall be dispatched with the crew.

The driver should exit the truck when the truck is to be stopped for more than 15 minutes.

Workers shall not be greater than 200 ft downstream of any protective or work vehicle. When utilized in a stationary work operation, the truck should be in neutral and the parking brake engaged.

The truck should have an actual weight of no less than 11,000 lb and no greater than 26,000 lb. Higher weights may be used when approved by the TMA manufacturer.

The truck should be positioned to allow a roll-ahead distance as indicated on the appropriate Work Zone Case or the table below (or other as recommended by the manufacturer).

Speed (mph)	Roll-Ahead Distance (ft)	
	Stationary Operations	Intermittent / Moving Operations
60 - 70	120	180
50 - 55	100	180
≤ 45	80	120

IX. Drop-off Guidelines

A drop-off is defined as an elevation difference between lanes or the traveled lane and shoulder as traversed by the wheel of a motor vehicle. Changes in elevation along highways present exposure to risk for highway users, especially vulnerable users (e.g. motorcyclists). Exposure can be limited by reducing speed, increasing lateral distance to the drop-off, providing a transition, or installing a barrier.

Protection of drop-off conditions should be considered when one of the following exists:

- A differential pavement elevation between open lanes; or
- A differential elevation between an open lane and an adjoining shoulder; or
- A hole, trench, or excavation off the pavement, but within the clear zone.

Additional information on drop-off conditions and countermeasures is available in the Bureau of Design and Environment Manual and Safety Policy 4-15.

X. Temporary Traffic Control Distance Charts

All devices shown on cases should be properly placed and their position maintained. All of the dimensions shown on the cases for the placement of devices are shown below. Distances on most roadways can easily be located by counting permanent skip-dash stripes. Since the dimensions are minimums and the stripes are spaced at 40 ft centers, adding 1/2 stripe cycle (20 ft), when needed, will keep it simple.

Distance in ft (mile)	Number of Stripes *		Distance in ft (mile)	Number of Stripes *		Distance in ft (mile)	Number of Stripes *
100	2 1/2		320	8		800	20
120	3		400	10		1000 (2/10)	25
180	4 1/2		500	12 1/2		1100	27 1/2
200	5		540 (1/10)	13 1/2		1200	30
220	5 1/2		600	15		1320	33
240	6		660	16 1/2		1500	37 1/2
260	6 1/2		720	18		1600 (3/10)	40
300	7 1/2		780	19 1/2		2000	50
						2600 (1/2)	65

* Cycles

Speed (mph)	Advance Sign Spacing (ft)			Buffer Space (ft) **	Shoulder Width (ft)							Taper Lengths (ft)	
	A	B	C		2	4	6	8	10	12	14	Merging Taper	Shifting Taper
30	100	100	100	200	10	20	30	40	50	60	70	180	90
35	100	100	100	250	15	30	40	55	70	85	95	245	125
40	100	100	100	305	20	35	55	70	90	110	25	320	160
45	350	350	350	360	30	60	90	120	150	180	210	540	270
50	350	350	350	425	35	70	100	135	170	200	235	600	300
55	500	500	500	495	40	75	110	150	185	220	260	660/1000	330
60	500	500	500	570	40	80	120	160	200	240	280	1000	360
65	1000	1600	2600	645	45	90	130	175	220	260	305	1000	390
70	1000	1600	2600	730	50	95	140	190	235	280	330	1000	420

** The buffer space length may be adjusted to meet individual work site conditions or may be eliminated by supervisor/Engineer approval.

XI. Layout Indices and Work Zone Cases

A. Guidelines for Selection of Work Zone Cases.....	48
B. Index Guide for Work Zone Case No. Selection.....	50
C. Brief Encroachments (< 15 Minutes).....	74
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A. Guidelines for Selection and Index Guide

The following pages contain listings for most of the work activities for day-to-day maintenance and traffic work that are conducted on or adjacent to roads and streets open to traffic. In most situations, this reference should help IDOT field crews to select the proper traffic control for the type of work and its location.

General notes:

- 1) Whenever possible, work should be conducted without any intrusion into a traveled lane. For work on shoulders that must intrude within 2 ft of a traveled lane, signs, protective vehicles and/or flaggers may be required as called for in:
 - a. Work Zone Cases listed
 - b. Short Term and Brief Encroachments (This provision does not apply to pavement pothole or bridge patching.)
- 2) In many of the Index Guides there are several cases from which to choose. The selection of the proper case is dependent on three (3) variables: speed of traffic, volume of traffic, and the amount of time workers are in the work area.

- 3) Roadside and some bridge work can usually be conducted a sufficient distance from lanes open to traffic, such that the use of vehicle strobe/warning lights as defined on page 20 will be all that is needed. Refer to appropriate Work Zone Case for guidance.
- 4) The index guides for Work Zone Case number selection show most typical applications for each work activity, but may not be all inclusive.
- 5) Other appropriate Work Zone Cases, IDOT Highway Standards as determined by contract, or Contract Traffic Control Plans may be utilized if the work site situations are applicable.
- 6) When an activity does not have a case number:
 - a. Either the work is more than 15 ft off of the roadway or more than 2 ft beyond the curb;
 - b. A case must be selected which most closely applies; or
 - c. A special detail shall be developed.
- 7) Work Zone Cases are not drawn to scale and the number of devices shown do not necessarily reflect the number of devices required to setup the Work Zone Case.

- 8) Special work requires special attention. Work activities that are not conducted under normal conditions and work activities at locations that require special considerations should be planned in advance of the time workers are scheduled to perform the task(s). Each worker and supervisor should be alert for any circumstance which would require change. Deviations from the Case Number selection index shall be with the approval of the supervisor/Engineer.

- 9) Department employees used to perform flagging or to stop traffic shall be trained flaggers.

B. Index Guide for Work Zone Case No. Selection

Highway Safety Information on Contract Projects:

When State work forces are exposed to the hazards of traffic, **the Engineer shall ensure their safety by providing appropriate traffic control and protection.** On projects with contracts let and the Contractor is on the project, most traffic control should be provided by the Contractor with Highway Standards included in the contract. On active projects the Contractor may be required to provide TTC for the Engineer and inspection staff. Infrequently, IDOT personnel working on a project may do a layout or inspection outside the limits of the Contractor's traffic control and protection. **If this cannot be done safely by utilizing the "Brief Encroachments" (page 74) and "Short Term Encroachments" (page 75), the contractor should be required to provide the proper traffic control and furnish signs, channelizing devices, flaggers, and other necessary traffic control items as directed by the Engineer.** This work should be paid at the contract unit price for that standard or by force account in accordance with the Standard Specifications for Road and Bridge Construction. For patching contractors

on multilane roadways, the Contractor may be required to provide traffic control 2 days early in advance of work, so that IDOT personnel may mark patches.

When personnel, surveyors, or inspectors are on the roadway, advance warning signs shall be used, except when the "Brief Encroachments" (page 74) and "Short Term Encroachments" (page 75), is being utilized. SURVEY CREW warning signs may be substituted for ROAD WORK AHEAD signs, as appropriate, to better advise motorists of the hazard they approach. Otherwise, signs and signing requirements should be as required under the appropriate Standards or Work Zone Case.

The taking of measurements in a traffic lane should be performed as quickly as possible. Standing in or adjacent to an open traffic lane should be avoided while discussing the work or while transmitting or recording readings.

Exposures of personnel to peak traffic volumes should be avoided by scheduling the working hours of personnel to be near the roadway during periods of off-peak traffic conditions, when possible.

Vehicles of employees are to be legally parked 15 ft or more from the edge of the traveled way and in the same direction of traffic. Vehicles parked within 15 ft of the pavement edge must be in the same direction of traffic and have their strobe/warning lights operating. All vehicles shall be parked in the direction of the traffic on the same side of the pavement.

Only trained/certified flaggers shall be used to perform flagging or stop traffic.

Have a minimum of two employees present when working.

- * The "Brief Encroachments" (page 74) and "Short Term Encroachments" (page 75) may be used where it is safe/applicable.

Contract Projects Index Guide:

Index Guide for when the Contractor is not able to supply the Traffic Control.

Marking Patches and other on pavement investigations:

Multilane	High Traffic Volumes > 20,000 ADT	WZ 40, 41, 42, 44, 46, 47
Multilane	Low Traffic Volumes ≤ 20,000 ADT	* , WZ 40, 41, 42, 44, 46, 47, S4
Two lane	Traffic Volumes > 5,000 ADT	WZ 21, 24, S2
Two lane	Traffic Volumes ≤ 5,000 ADT	* , WZ 21, 24, 30, S2

Layout and Staking with Instrument on Pavement and chaining Along Centerline:

Multilane	WZ 40, 41, 42, 44, 46, 47, 48, 49, 60, 62, 92	
Two lane	High Traffic Volumes > 5,000 ADT	WZ 21, 22, 24, S2
	Low Traffic Volumes ≤ 5,000 ADT	WZ 21, 22, 24, 30, S2, S5

Profiling:

Two lane	WZ 22, 24
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Cross Sectioning (No Instrument on Pavement)

Multilane	* , WZ 04, 06, 40, 46, 47, 48, 49, 60, 62, S4
Two lane	* , WZ 04, 06, 21, 22, 24, 30, S2
Intersections	WZ 91, 94

Walk On / Walk Off Miscellaneous Inspections:

Multilane	* , WZ 40, 46, 47, 48, 49, S4
Two lane	* , WZ 21, 24, 30, S2

- * The "Brief Encroachments" (page 74) and "Short Term Encroachments" (page 75) may be used where it is safe/applicable.

Day Labor Type Operations and Other Similar Operations:

Unloading Equipment and Supplies:	WZ 03, 04, 21, 40	
Shoulder Rock Projects:	WZ 22, 46, 48	
Beam Changes / Straightening and Bridge Joint Work - Daytime Operations	Multilane	WZ 41, 44
	Two lane	WZ 21
Bump Milling Operations	Multilane	WZ 03, 04, 21, 40
	Two lane	WZ 21, 22, 24

Joint Cutting:

This work may be done utilizing the following Work Zone Cases by making a few minor adjustments. On multilane roadways when the saw encroaches into an open lane, the channelizing devices shall be moved about 4 ft into the open lane to allow for the encroachment. The taper shall be at the same rate as the taper that closed the lane. The flagger, when required, shall stay behind the channelizing devices. The channelizing devices shall be moved back to their original position as soon as possible. One side of the highway will be done at a time.

Joint Cutting:

Multilane	WZ 41, 42, 44, 47, 48, 49
Two lane	WZ 21, 22, 24

General Survey Safety Information:

1. **It is each employee's responsibility to work in a safe manner.** Safety is not to be compromised.
2. Peak traffic volumes should be avoided by scheduling working hours to be near the roadway during periods of off-peak traffic conditions, when possible.
3. Vehicles should be legally parked facing the same direction as traffic flow and more than 15 ft from the edge of the traveled way in rural areas. In urban areas, vehicles should be parked in parking lanes. Vehicles parked within 15 ft of the pavement edge must have their strobe/warning lights operating, unless in a marked parking lane. All vehicles shall be parked on the same side of the pavement in the same direction as the traffic flow.
4. Workers:
 - a) Shall utilize the "Brief Encroachments" (page 74) or "Short Term Encroachments" (page 75), where applicable. Minimize the number of workers in or within two (2) feet of the traveled lane.
 - b) Shall plan an escape route.
 - c) Shall always look in both directions before walking into or within two (2) feet of traveled lane.
 - d) Shall discuss work and transmit and record data away from open traveled lanes and the area adjacent to an open traveled lane, as much as possible.
 - e) Should avoid turning their back to traffic.
 - f) Shall use only trained/certified flaggers to perform flagging or stop traffic.

5. **Two-Lane Roadways:**

- a) Use strobe/warning lights on vehicle when driving slower than normal speed, and when stopped.
- b) Minimize stopping vehicle on shoulder. When possible, park at entrances.
- c) When possible, avoid parking on narrow shoulders or in "no-passing zones."
- d) The "Brief Encroachments" (page 74) and "Short Term Encroachments" (page 75) and WZ 30 may be utilized where applicable.

6. **Multilane Roadways:**

- a) Drive on shoulder with strobe/warning lights on when traveling significantly slower than normal speeds and when parked.
- b) Park on the outside or median shoulder, whichever is closer to the work.
- c) Make sure vehicle is parked on the shoulder of the lanes in which you are working. Do not cross the median and work in the opposite direction lanes without moving the vehicle.
- d) Stop / park vehicle as far as possible off the edge of the pavement.
- e) Minimize walking / running across traffic lanes.

Workers should enter onto the pavement only during appropriate gaps in traffic in accordance with the "Brief Encroachments" (page 74) and "Short Term Encroachments" (page 75). If the operation requires workers to remain in a traffic lane, the lane must be closed with proper traffic control signs and devices.

Field Checks, Inspections, Meetings & Notes, Final Inspections, Hydraulic Checks, Misc. Inspections, Patching, Pickup & Road Condition Surveys:

Multilane Roadways:	* , WZ 04, 05, 06, 40, 46, 47, 49, 60, 62, S4
Two Lane Roadways > 5000 ADT:	* , WZ 04, 05, 06, 21, 24, S2
Two Lane Roadways < 5000 ADT:	* , WZ 04, 05, 06, 21, 24, 30, S2

Short Intermittent periods of time on the pavement, i.e. Traffic Counter Tubes:

Multilane Roadways:	* , WZ 40, 46, 47, 60
Two Lane Roadways:	* , WZ 24, 30
Intersections:	* , WZ 91, 94

* The "Brief Encroachments" (page 74) and "Short Term Encroachments" (page 75) may be used where it is safe/applicable.

Data Collection / Maintenance of Permanent Counter Stations and Installation of Counter Stations on Pavement:

Multilane Roadways:	* , WZ 40, 41, 42, 46, 47, 48, 51
Two Lane Roadways:	* , WZ 21, 30

Bridge Deck Soundings:

Multilane Roadways:	WZ 40, 41, 46, 47, 48, 49
Two Lane Roadways:	WZ 21, 24, 30

Surveys in vehicle, driving slower than prevailing speed:

Flashing strobe/warning lights on vehicle.
--

Surveying Crew Safety Information:

- 1. The employee placed in charge of the survey crew shall have the primary responsibility for ensuring that traffic control is established.**
2. It shall be each employee's responsibility to work in a safe manner and to provide a safe environment for the crew and the traveling public. Safety is not to be compromised.
3. Crew chief shall discuss with their supervisor the use of additional devices when increased traffic volume necessitates, including, but not limited to: additional flaggers, lane closures, use of spotters to watch for hazardous conditions and to warn the crew.
4. Offset surveying procedures should be used whenever possible. Actual time on the roadway should be kept to a minimum.
5. Peak traffic volumes should be avoided by scheduling the working hours of personnel to be near the roadway during off-peak traffic periods.
6. Operations other than centerline chaining require frequent short duration movements on / off the roadway and the use of flaggers shall be required by the appropriate case.
7. SURVEY CREW warning signs may be substituted for ROAD WORK AHEAD signs so that motorists are more aware of the hazard they approach. SURVEY CREW warning signs may also be substituted for ROAD WORK AHEAD signs for any non-survey work zone cases used.
8. Vehicles of employees should be legally parked 15 ft from the edge of the traveled way in the direction of traffic flow. Vehicles parked within 15 ft of the pavement edge shall have their strobe/warning lights operating. All vehicles shall be parked on the same side of the pavement and in the direction of traffic flow.

9. Workers:

- a) Shall utilize the "Brief Encroachments" (page 74) or "Short Term Encroachments" (page 75), where applicable. Minimize the number of workers in or within two (2) feet of the traveled lane.
- b) Shall plan an escape route.
- c) Shall always look both directions before walking onto or within two (2) feet of the traveled lane.
- d) Shall discuss work and transmit and record data away from open traveled lanes and the area adjacent to an open traveled lane, as much as possible.
- e) Should avoid turning their back to traffic.
- f) Shall use only trained/certified flaggers to perform flagging or stop traffic.

10. Workers shall not stand directly behind or in front of a vehicle.

11. **Two Lane Roadways:**

- a) Strobe/warning lights shall be used on vehicles when driving slower than normal speed, and when stopped.
- b) Workers shall minimize stopping vehicle on shoulder. When possible, park at entrances.
- c) When possible, parking on narrow shoulders or in "no-passing zones" should be avoided.
- d) The "Brief Encroachments" (page 74) and "Short Term Encroachments" (page 75) and WZ 30 may be utilized where applicable.

12. Multilane Roadways:

- a) Workers shall drive on shoulder with strobe/warning lights on when traveling significantly slower than normal speeds.
- b) Workers shall park in the same direction as adjacent traffic flow on the outside or median shoulder, whichever is closer to the work.
- c) Workers should park vehicle, with strobe/warning lights on, on the shoulder of the lane in which they are working. The vehicle should be used before crossing the median and working in the opposite direction lanes.
- d) Stop / park vehicle as far as possible off the edge of the pavement.
- e) Workers shall minimize walking / running across traffic lanes.
- f) Workers should enter onto the pavement only during appropriate gaps in traffic in accordance with "Brief Encroachments" (page 74) and "Short Term Encroachments" (page 75). If operation requires workers to remain in a traffic lane, the lane shall be closed with proper traffic control signs and devices.

Layout & Staking With Instrument on the Pavement and Chaining Along the Centerline:

Multilane Roadways:	WZ 40, 41, 42, 44, 44a, 45a, 46, 47, 48, 49, 60, 62, 92
Two Lane Roadways:	WZ 21, 22, 24, 30, S2, S5

* The "Brief Encroachments" (page 74) and "Short Term Encroachments" (page 75) may be used where it is safe/applicable.

Field Surveys Without an Instrument on the Pavement:

Multilane Roadways:	* , WZ 04, 06 , 07b, 40, 46, 47, 48, 49, 60, 62, S4
Two Lane Roadways:	* , WZ 04, 06, 07a, 21, 22, 24, 30, S2
Intersections:	* , WZ 91, 94

Bridge Inspector Safety Guidelines:

1. **The supervisor assigned for the inspection crew is responsible for ensuring that traffic control is properly established and maintained.** The guidelines in this section are "minimums" and should be supplemented as needed to minimize hazardous conditions, such as poor sight distance, poor weather conditions, higher traffic speeds, higher traffic volumes, sharp curves, tight clearances, etc. **Extra care is required while working on bridges, because of the lack of an escape route. When in doubt, add additional traffic control.** In no case can any of the requirements be reduced or eliminated.
2. Peak traffic volumes should be avoided by scheduling working hours in or near the traveled lane during periods of off-peak traffic conditions.
3. Workers:
 - a) Shall utilize the "Brief Encroachments" (page 74) or "Short Term Encroachments" (page 75), where applicable. Minimize the number of workers in or within two (2) feet of the traveled lane.
 - b) Shall plan an escape route.
 - c) Shall always look both directions before walking onto or within two (2) feet of the traveled lane.
 - d) Shall discuss work and transmit and record data away from open traveled lanes and the area adjacent to an open traveled lane, as much as possible.
 - e) Should avoid turning their back to traffic.
 - f) Shall use only trained/certified flaggers to perform flagging or stop traffic.
 - g) Shall stop/park vehicle as far as practical off the edge of the traveled lane and shoulder.

Bridge Inspector Index Guide:

As a minimum, the following cases should be utilized for daylight inspections that will last 60 minutes or less:

Case I: 2-Lane ADT < 5,000 or Multilane ADT < 10,000:

Utilize "Brief Encroachments" (page 74) and "Short Term Encroachments" (page 75) / WZ 30.

Case II: 2-Lane ADT \geq 5,000 < 10,000 or Multilane ADT \geq 10,000 < 20,000:

- a) Vehicle parked in a visible location with strobe/warning lights operating, and
- b) Two signs in each direction for 3 lane roadways or less and undivided multilane roadways.
(See WZ B1 & B3), or
- c) Four signs in each direction for more than 3 lanes; divided. (See WZ B2)

Case III: 2-Lane ADT \geq 10,000 or Multilane ADT > 20,000:

Utilize cases required for work lasting more than 60 minutes, listed below.

The following cases shall be utilized for daylight inspections that will last more than 60 minutes:

Multilane Roadways:	WZ 04, 05, 06, 40, 41, 42, 44, 44a, 46, 47, 49, 50, 51
Two Lane Roadways:	WZ 04, 05, 06, 21, 24, 30

Drill Crew Safety Guidelines:

1. **The drill site and crew shall be protected at all times with the proper signs and flaggers in accordance with this Manual.** A copy of this Manual should be in each vehicle. **All personnel should be aware of which Work Zone Case is being used, what is involved with the setup, and who is in charge of the traffic control.** Any vehicle within the limits of the traffic control "work area" and within 15 ft of the pavement edge shall have strobe/warning lights operating at all times.
2. Safety is the responsibility of all members of the drill crew. Working together in close communication with each other is imperative. Any unsafe or questionable condition shall be called to the attention of the crew chief and discussed with other crew members and corrected.
3. Only trained/certified flaggers shall be used to perform flagging or stop traffic.

Pavement Core < 60 minutes

Multilane Roadways:	WZ 04, 05, 40, 41, 46, 47, 48, 49, 50, 51
Two Lane Roadways:	WZ 03, 04, 21, 22
Intersections:	WZ 91, 92, 93, 94, 95, 95a
Ramps:	WZ 60, 62

Soil Boring < 60 minutes

Multilane Roadways:	WZ 04, 05, 40, 41, 46, 47, 48, 49, 50, 51
Two Lane Roadways:	WZ 03, 04, 21, 22
Intersections:	WZ 92, 93
Ramps:	WZ 60, 62

Structure Borings

Multilane Roadways:	WZ 41, 42
Two Lane Roadways:	WZ 06, 21

Soil Boring > 60 minutes

Multilane Roadways:	WZ 41, 42, 46, 47, 48, 50, 51
Two Lane Roadways:	WZ 06, 21
Intersections:	WZ 92, 93
Ramps:	WZ 61, 62

Portable Scale Crew Safety Guidelines:

1. Safety is the responsibility of all members of the portable weight scale crew. Working together in close communication with each other is imperative. Any unsafe or questionable condition shall be called to the attention of the supervisor and discussed with other crew members and corrected. Safety is not to be compromised.
2. The guidelines in this section are minimums and should be supplemented as needed to minimize hazardous conditions.
3. Workers:
 - a) Shall spend the least time possible in the area between / around the trucks.
 - b) Shall spend the least time possible crossing between where trucks are moving / parking.
 - c) Shall look in both directions when moving in the area of the trucks.
 - d) Should avoid turning their backs to traffic.
 - e) Shall avoid standing directly in front of or in back of vehicles.
 - f) Shall discuss work, transmit and record data in a safe location.
 - g) Shall plan an escape route.
4. Oncoming traffic should have a clear, unobstructed view for at least 1500 ft prior to the truck weighing zone. This may be reduced in areas of lower posted speed limits.

5. Selecting sites for scale operation:
 - a) Interstate Rest Areas should not be used during tourist season, between May 16 through September 15. When rest areas are utilized, caution must be used to prevent blockage of entry ramps so that access is always provided to the motorists.
 - b) It is highly desirable to vary the hours of operation of the scales. During periods of darkness, only well lit locations should be utilized. It may be necessary to supplement the lights with portable or fixed lighting.
 - c) New locations for portable scales are considered on a case by case basis. Contact supervisor for the correct method of requesting such a location.
6. Weighing operations should not be conducted when conditions are such that safety would be compromised. The surface of scales should be dry to prevent slippage of truck tires.

Weighing of trucks should not be done under the following conditions:

- a) **Wet conditions. (At the discretion of the Illinois State Police)**
- b) **Ground fog, this severely restricts visibility and makes the scales unstable.**
- c) **Blowing snow.**
- d) **Ice.**

7. The scale crew has the following signs and equipment:
- a) TRUCK SCALES AHEAD sign - (48" diamond, black letters on yellow)
 - b) ALL TRUCKS MUST WEIGH - (48" square, black letters on white)
 - c) TRUCKS USE RIGHT LANE SCALES AHEAD (48" square black letters on white)
 - d) CARS USE LEFT LANE - (48" square, black letters on white)
TRUCKS USE RIGHT LANE - "LEFT" AND "RIGHT" words are interchangeable
 - e) TRUCK SCALES - (48" square, black letters on white, arrow is reversible) -----> (arrow)
 - f) Sign stands.
 - g) 28" narrow profile high visibility cones.
 - h) Reflective cone collars.
 - i) Fire extinguisher - 10 pound dry chemical, A-B-C Fires.
 - j) Red flags.
 - k) Operable flashlight.

Portable Scale Cases

Multilane Roadways:	WZ W1, W2, W3
Two Lane Roadways:	WZ W4, W5, W6

Index Guide for Work Zone Case No. Selection

Code	Work Activity Pavement	2-lane 2-way	Multilane	Intersection
410	Pothole Patching	WZ 21, 22, 30	WZ 07b, 40, 41, 42, 46, 48, 63, 64, 65, 66	WZ 92, 93, 95, 95a
411	Partial Depth Patching	WZ 21, 22	WZ 40, 41, 42, 44, 44a, 50, 51, 64, 65, 66	WZ 92, 93, 95a
412	Full Depth Patching	WZ 21	WZ 40, 41, 42, 44, 44a, 50, 51, 64, 65, 66	WZ 92, 93, 95a
413	Bituminous Overlay	WZ 21, 22	WZ 41, 42, 44, 44a, 50, 51, 64, 65, 66	WZ 92, 93, 95a
414	C.R.C. Pavement Patching	WZ 21	WZ 41, 42, 44, 44a, 50, 51, 64, 65, 66	WZ 92, 93, 95a
415	Bump Burning or Planing	WZ 21, 22	WZ 40, 46, 47, 48, 49, 63, 64, 65, 66	WZ 92, 93, 95, 95a
416	Crack & Joint Sealing - Hand Poured	WZ 21, 22	WZ 40, 46, 47, 48, 49, 63, 64, 65, 66	WZ 92, 93, 95, 95a
417	Sealing or Skin Patching	WZ 21, 22	WZ 40, 46, 47, 48, 49, 63, 64, 65, 66	WZ 92, 93, 95, 95a
510	Pothole Patching - Liquid Asphalt & Chips	WZ 21, 22	WZ 40, 46, 48, 49, 50, 63, 64, 65, 66	WZ 92, 93, 95, 95a
515	Pavement Milling	WZ 21, 22	WZ 41, 42, 44, 44a, 50, 51, 64, 65, 66	WZ 92, 93, 95a
516	Crack & Joint Routing	WZ 21, 22	WZ 40, 46, 48, 49, 50, 63, 64, 65, 66	WZ 92, 93, 95, 95a
517	Crk & Jt Clean & Seal with Rubzd Asphalt	WZ 21, 22	WZ 40, 46, 48, 49, 50, 63, 64, 65, 66	WZ 92, 93, 95, 95a
518	Transverse Joint Remove and Repair	WZ 21, 22	WZ 40, 46, 48, 49, 50, 63, 64, 65, 66	WZ 92, 93, 95, 95a

Code	Work Activity Shoulders & Side Approaches	2-lane 2-way	Multilane
420	Patch & Repair Paved Shoulders	WZ 04, 05, 06, 07a, 22	WZ 04, 05, 06, 07b, 40, 41, 63
421	Add and Spread Aggregate - Hand	WZ 04, 05, 06, 07a, 24	WZ 04, 05, 06, 07b, 63
422	Add and Spread Aggregate - Machine	WZ 05, 07a, 22, 24	WZ 05, 07b, 63
423	Sealcoat Application	WZ 05, 07a, 22, 24	WZ 05, 07b, 63
424	Cutting High Shoulders	WZ 05, 07a, 22, 24	WZ 05, 07b, 63
425	Blading and Dragging	WZ 05, 07a, 22, 24	WZ 05, 07b, 63
426	Shoulder Wedging	WZ 05, 07a, 22, 24	WZ 05, 07b, 63
427	Concrete Shoulder Patch	WZ 04, 05, 06, 07a, 22	WZ 04, 05, 06, 07b, 40, 41, 63

Code	Work Activity Other	2-lane 2-way	Multilane
752	Slope Wall Repair	WZ 03, 04, 06, 21	WZ 03, 04, 06, 40, 41, 42, 50, 64, 65, 66
753	Collection Gutter Cleaning	WZ 03, 04, 06, 21	WZ 03, 04, 06, 40, 41, 42, 50, 64, 65, 66
754	Collection Gutter Repair	WZ 03, 04, 06, 21	WZ 03, 04, 06, 40, 41, 42, 50, 64, 65, 66
755	Rip Rap Placement	WZ 03, 04, 06, 21	WZ 03, 04, 06, 40, 41, 42, 50, 64, 65, 66
756	Channel Maintenance	WZ 03, 04, 06, 21	WZ 03, 04, 06, 40, 41, 42, 50, 64, 65, 66
	Accidents / Emergencies	WZ 01	WZ 02

Code	Work Activity Drainage	2-lane 2-way	Multilane	Intersection
430	Repairing Earth Slopes	WZ 03, 04, 06, 07a, 21	WZ 03, 04, 06, 07b, 40, 41, 42, 64, 65, 66	
431	Ditches - Hand	WZ 03, 04, 06, 07a, 21	WZ 03, 04, 06, 07b, 40, 41, 42, 64, 65, 66	
432	Ditches - Machine	WZ 03, 04, 06, 07a, 21, 22	WZ 03, 04, 06, 07b, 40, 41, 42, 64, 65, 66	
433	Inlet, Manhole & Catch Basin Cleaning	WZ 04, 06, 07a	WZ 04, 06, 07b, 63, 64, 65, 66	
434	Inlet, Manhole & Catch Basin Repair	WZ 03, 04, 06, 21	WZ 03, 04, 06, 07b, 40, 41, 42, 64, 65, 66	
435	Sewer Line, Pipe & Culvert Cleaning	WZ 03, 04, 06, 07a, 21, 22	WZ 03, 04, 06, 07b, 40, 41, 42, 63, 64, 65, 66	
436	Sewer Line, Pipe & Culvert Repair	WZ 03, 04, 06, 21	WZ 03, 04, 06, 40, 41, 42, 64, 65, 66	WZ 92, 93, 95a
438	Underdrain Maintenance	WZ 03, 04, 06, 21	WZ 03, 04, 06, 07b, 40, 41, 42, 64, 65, 66	

Code	Work Activity Bridge	2-lane 2-way	Multilane	Intersection
454	Bridge Inspection (Lane Closure)	WZ 03, 21, 30	WZ 03, 40, 41, 42, 44, 44a, 45, 45a, 60, 61, 63, 64, 65, 66	WZ 92
455	Bridge Sealing	WZ 21, 24	WZ 03, 40, 41, 42, 44, 44a, 64, 65, 66	
550	Bridge Cleaning (over 1 hr. duration)	WZ 05, 21, 22	WZ 05, 40, 41, 42, 44, 44a, 45, 45a, 60, 61, 64, 65, 66	WZ 92
550	Bridge Cleaning (less than 1 hr.)	WZ 03, 21	WZ 03, 40	
551	Partial Depth Bridge Deck Patching	WZ 21	WZ 03, 41, 42, 44, 44a, 45, 45a, 60, 61, 64, 65, 66	WZ 92
552	Full Depth Bridge Deck Patching	WZ 21	WZ 03, 41, 42, 44, 44a, 45, 45a, 60, 61, 64, 65, 66	WZ 92
553	Deck Drain Cleaning	WZ 03, 05, 21	WZ 03, 05, 40, 41, 42, 44, 44a, 60, 61, 64, 65, 66	WZ 92
554	Deck Drain Repair	WZ 03, 21	WZ 03, 40, 41, 42, 44, 44a, 60, 61, 64, 65, 66	WZ 92
555	Joint Protection Shielding	WZ 21	WZ 03, 40, 41, 42, 44, 44a, 45, 45a, 60, 61, 64, 65, 66	WZ 92
556	Joint Deck Slab Shoring	WZ 21	WZ 03, 40, 41, 42, 44, 44a, 45, 45a, 60, 61, 64, 65, 66	WZ 92

Code	Work Activity Bridge	2-lane 2-way	Multilane
557	Expansion Joint Repair	WZ 03, 21	WZ 03, 40, 41, 42, 44, 44a, 45, 45a, 60, 61, 64, 65, 66
558	Roadway Joint Maintenance	WZ 03, 21	WZ 03, 41, 42, 44, 44a, 45, 45a, 63, 64, 65, 66
559	Handrail Repair / Maintenance	WZ 03, 21	WZ 03, 40, 41, 42, 64, 65, 66
650	Bridge Guardrail Terminal Repair	WZ 03, 21	WZ 03, 40, 41, 42, 63, 64, 65, 66
652	Bridge Bearing Maintenance (Exc. Actv. 653 and 654)	WZ 03, 21	WZ 03, 40, 41, 42, 64, 65, 66
653	Bridge Bearing Cleaning	WZ 21	WZ 40, 41, 42, 64, 65, 66
654	Bridge Bearing Painting	WZ 21	WZ 40, 41, 42, 64, 65, 66
655	Structural Steel Repair	WZ 03, 21	WZ 03, 40, 41, 42, 44, 44a, 45, 45a, 64, 65, 66
656	Jacking and Cribbing	WZ 03, 21	WZ 40, 41, 64, 65, 66
657	Pin and Link Inspection and Maintenance	WZ 21	WZ 40, 41, 42, 64, 65, 66
750	Bridge Concrete Repair	WZ 03, 21	WZ 03, 40, 41, 42, 44, 44a, 45, 45a, 64, 65, 66
751	Bridge Epoxy Injection	WZ 21	

Code	Work Activity Roadside	2-lane 2-way	Multilane
440	Tree, Brush & Shrub Removal	WZ 04, 07a, 21, 22	WZ 04, 07b, 40, 41, 42, 64, 65, 66
441	Landscape, Tree, Shrub & Plant Maint	WZ 04, 07a, 21	WZ 04, 07b, 40, 41, 42, 64, 65, 66
442	Mowing - Hand	WZ 04, 07a	WZ 04, 07b
443	Mowing - Machine	WZ 04, 05, 07a	WZ 04, 07b
444	Right-Of-Way Vegetation Spraying	WZ 04, 05, 07a	WZ 04, 07b
445	Strip Vegetation Spraying	WZ 05, 07a	WZ 05, 07b
446	Mechanical Sweeping		WZ 05, 52
447	Litter Pickup	WZ 07a	WZ 07b
448	Road Patrol and Debris Cleanup	WZ 04, 05, 07a	WZ 04, 05, 07b
449	Manual Chemical Spray	WZ 04, 05, 07a	WZ 04, 05, 07b
741	Tree and Shrub Plant	WZ 04, 06, 07a, 21, 22	WZ 04, 06, 07b, 40, 41, 42, 64, 65, 66
742	Tree Spraying	WZ 04, 07a	WZ 04, 07b
743	Mulching	WZ 04, 07a	WZ 04, 07b
744	Fertilizer Application	WZ 04, 07a	WZ 04, 07b
745	Seeding	WZ 04, 07a	WZ 04, 07b
746	Sodding	WZ 04, 07a	WZ 04, 07b

Code	Work Activity Traffic Duties	2-lane 2-way	Multilane	Intersection
200	Sign Maintenance	WZ 03, 04, 21, 22	WZ 03, 04, 40, 41, 44, 44a, 50, 60, 64, 65, 66	WZ 91, 92, 93, 94, 95, 95a
220	Center / Lane Striping	WZ 23	WZ 52	
222	Edge Line Striping	WZ 23	WZ 52	
223	Simultane Striping	WZ 23	WZ 52	
224	Spec Pvmnt Marking	WZ 21	WZ 40, 50	WZ 92, 93, 95, 95a
225	Curb Marking	WZ 21	WZ 40, 41, 42	WZ 92, 93, 95, 95a
226	Marking Removal	WZ 21	WZ 40, 50	WZ 92, 93, 95, 95a
227	Rd / Cb Marker Maint	WZ 04, 06	WZ 04, 06, 48	WZ 92, 93, 95, 95a
240	Traffic Signal Maint	WZ 04, 21	WZ 40, 41, 42	WZ 91, 92, 93, 94
241	Highway Lighting Maint	WZ 03, 04, 21	WZ 03, 04, 40, 41	WZ 92
242	Flash Beacon Maint	WZ 03, 04, 21		

Code	Work Activity Traffic Services and Facilities	2-lane 2-way	Multilane
460	Guardrail Maintenance	WZ 03, 04, 06, 07a, 21	WZ 03, 04, 06, 07b, 41, 42, 63, 64, 65, 66
461	Fence Maintenance	WZ 03, 04, 06	WZ 03, 04, 06
462	Barrier Wall Maintenance & Repair	WZ 03, 04, 06	WZ 03, 04, 06
463	Attenuator Maintenance	WZ 03, 04, 06	WZ 03, 04, 06
466	Advertising Sign Removal	WZ 03, 04, 06	WZ 03, 04, 06
467	Delineator Maintenance	WZ 04, 06	WZ 04, 06, 63

C. Brief Encroachments (< 15 Minutes)

1. For non-emergency daylight operations where workers and/or equipment are in or within two (2) feet of the traveled lane in one location for less than 15 minutes.
For emergency operations refer to Emergency Call Outs (WZ 00, WZ 01, WZ 02)
2. If the worker is unable to visually monitor traffic when performing the activity during the brief encroachment, then at least two (2) workers should be present, one (1) of whom shall perform tasks as a spotter.
3. Workers and/or equipment shall enter into or within two (2) feet of the traveled lane only during appropriate gaps in traffic.
4. No attempts shall be made to stop, slow, or direct traffic into another lane. If the operation cannot be performed within appropriate gaps, refer to appropriate Work Zone case for guidance.
5. The amount of time the workers and/or equipment are in or within two (2) feet of the traveled lane shall be minimized.
6. Vehicle shall be as far as practical off the edge of the traveled lane and shoulder. On multilane roadways, vehicles may be driven at slow speeds on shoulder with strobe/warning lights operating. Vehicle shall not encroach into traveled lane.
7. The work vehicle should be on the same side of the road as the work.
8. Employee shall wear approved high visibility apparel. Vehicle shall have its strobe/warning lights on.

D. Short Term Encroachments (15-60 Minutes)

1. For non-emergency daylight operations where workers and/or equipment are in or within two (2) feet of the traveled lane in one location for 15 to 60 minutes.
For emergency operations refer to Emergency Call Outs (WZ 00, WZ 01, WZ 02)
2. When required, TTC devices shall be deployed according to applicable Short Term Work Zone cases (e.g. WZ 01, WZ 02, WZ 03, WZ 05, WZ 40, WZ 50, WZ 51, WZ 60, WZ 132, WZ S2, and WZ S4).
3. May be performed without a flagger, provided all vehicles and/or equipment are completely off the traveled lane.
4. No attempts shall be made to stop, slow, or direct traffic into another lane except by a properly equipped, trained/certified flagger with proper warning signs in place.
5. Vehicle shall be as far as practical off the edge of the traveled lane and shoulder. On multilane roadways, vehicles may be driven at slow speeds on shoulder with strobe/warning lights operating.
6. The work vehicle should be on the same side of the road as the work.
7. Employee shall wear approved high visibility apparel. Vehicle shall have its strobe/warning lights on.
8. Full lane closure, using pertinent Work Zone case, should be considered when work at one location may exceed 60 minutes.

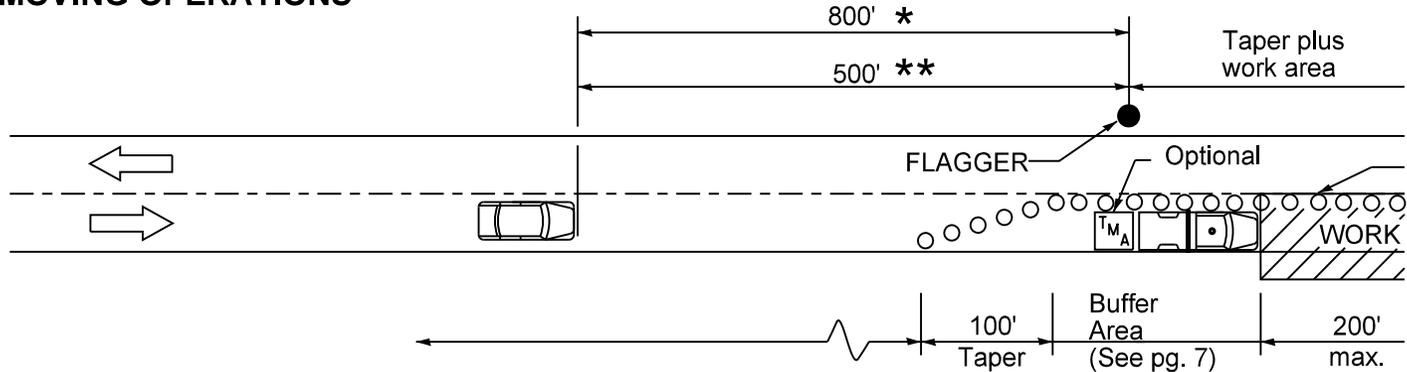
E. Flagging by Contractors' Personnel

Contractors' personnel used to perform flagging or to stop traffic shall be certified flaggers.

F. Emergency Call Outs

WZ 00, WZ 01 and WZ 02

**EMERGENCY OPERATIONS ONLY
2 LANE 2 WAY ROADWAY
USE OF 1 FLAGGER ALL SPEEDS
STATIONARY AND
MOVING OPERATIONS**

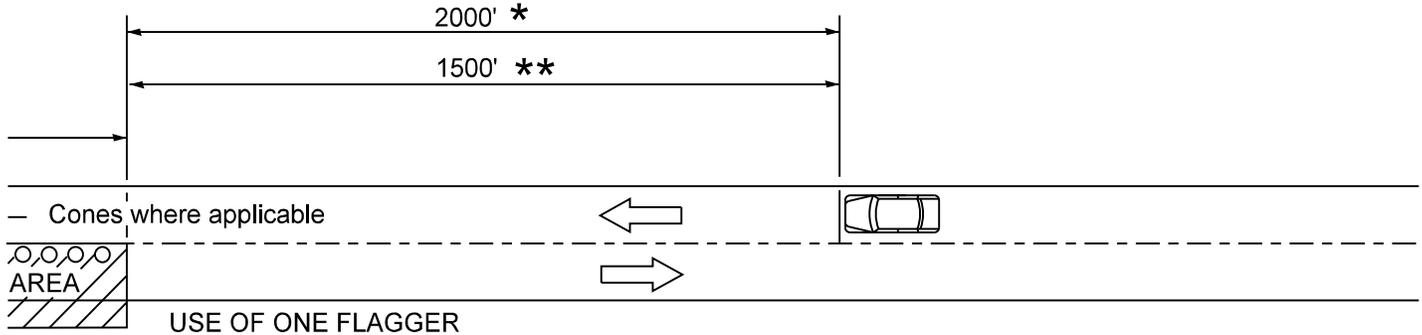


Note:

The flagger controls traffic in the closed lane only. The other lane operates free flow. The flagger should be stationed on the shoulder opposite the lane closure or in a position where good visibility and traffic control can be maintained at all times.

Cones at 20 ft centers on taper and at 50 ft centers along travel way.

- * UNRESTRICTED SIGHT DISTANCE 45 MPH OR MORE
- ** UNRESTRICTED SIGHT DISTANCE 40 MPH OR LESS



USE OF ONE FLAGGER

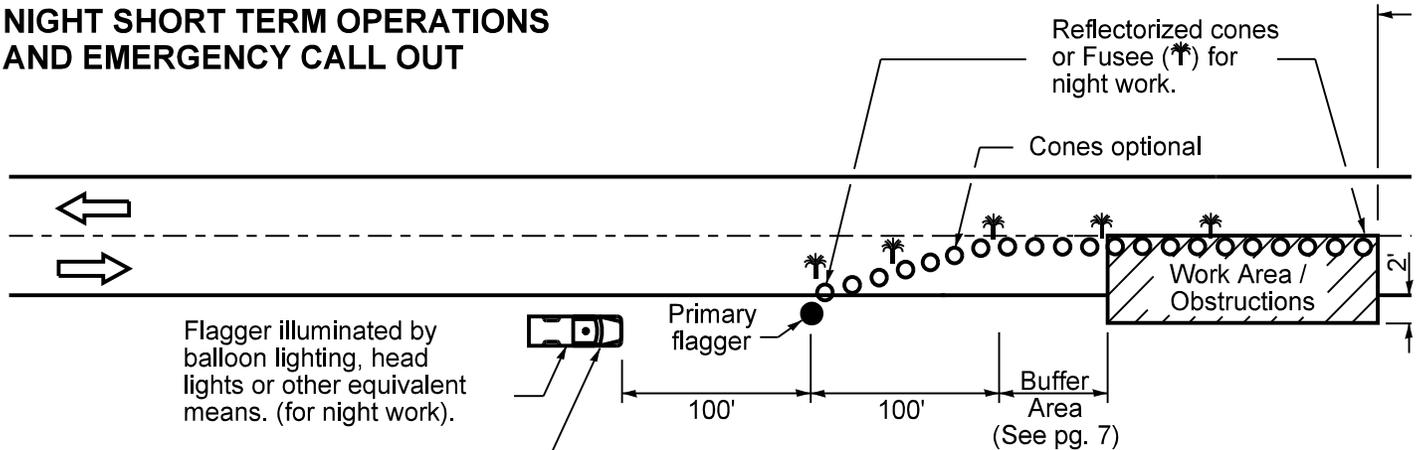
When one lane is closed on a Two-Lane Highway. One flagger may be used when:

- A. The flagger has an unrestricted sight distance beyond the work area as indicated in the diagram.
- B. The work area does not exceed 200 feet.
- C. The traffic is not delayed more than 3 minutes.
- D. When lane closure is to be in place for more than 2 hours, a full lane closure should be installed. Inform District dispatcher or Station One of situation.

Unless all of the above conditions are met, two flaggers shall be used.

**FIRST RESPONSE
 USE OF 2 FLAGGERS
 ALL SPEEDS
 2 LANE - 2 WAY
 NIGHT SHORT TERM OPERATIONS
 AND EMERGENCY CALL OUT**

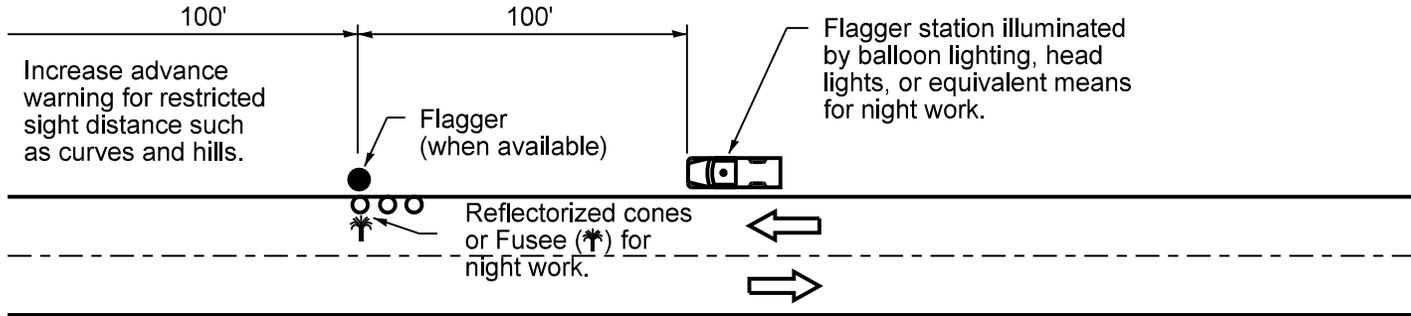
Note:
 Cones at 20 ft centers on taper and
 at 50 ft centers along travel way.



Flagger illuminated by balloon lighting, head lights or other equivalent means. (for night work).

First vehicle

1. First worker to respond:
 - a) Handles situation within 60 minutes, as per page 74.
 or:
 - b) Radios for help, sets up fuses/cones and flags as a single flagger, pages 76 and 77.
2. Second worker to arrive, sets up an approved case.

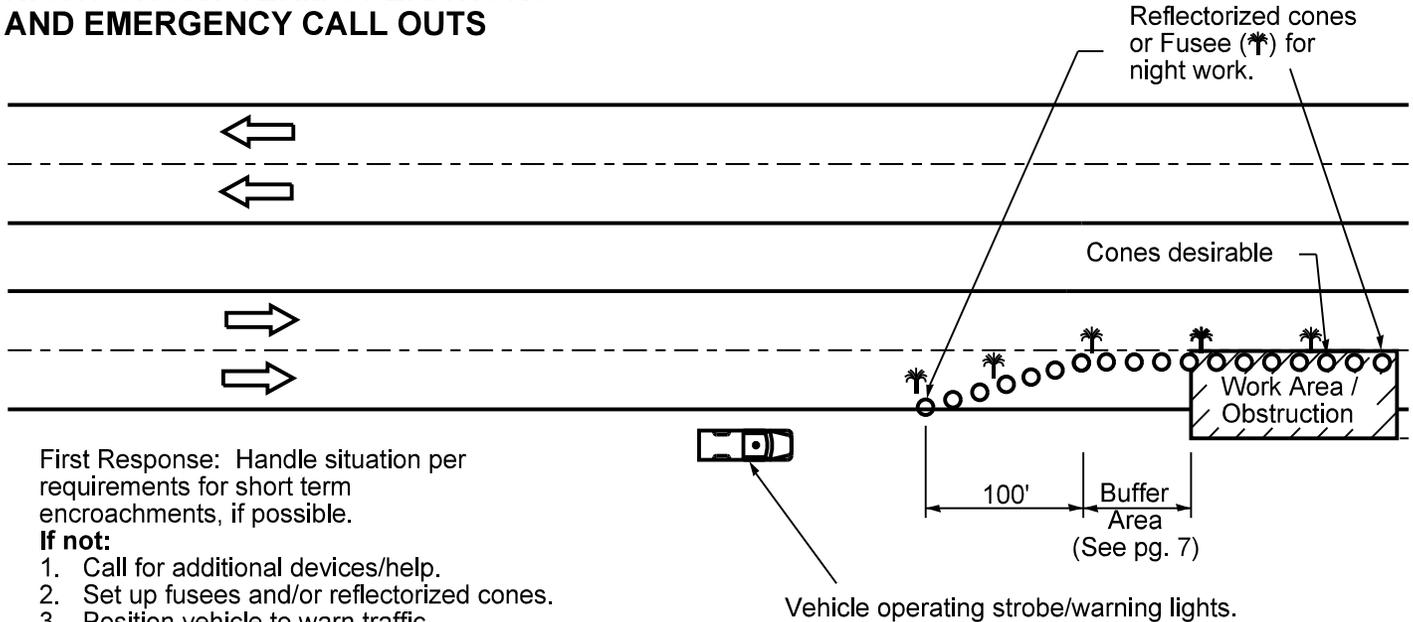


GENERAL NOTES

1. All vehicles with strobe/warning lights operating.
2. Arrow Board in CAUTION mode optional.
3. Reflectorized cones or Fusees are required for night work longer than 15 minutes.
4. For emergency call outs when lane closure is to be in place for more than 2 hours, a full lane closure should be installed. Inform District dispatcher or Station One of situation.

**FIRST RESPONSE
ALL SPEEDS
MULTILANE
NIGHT SHORT TERM OPERATIONS
AND EMERGENCY CALL OUTS**

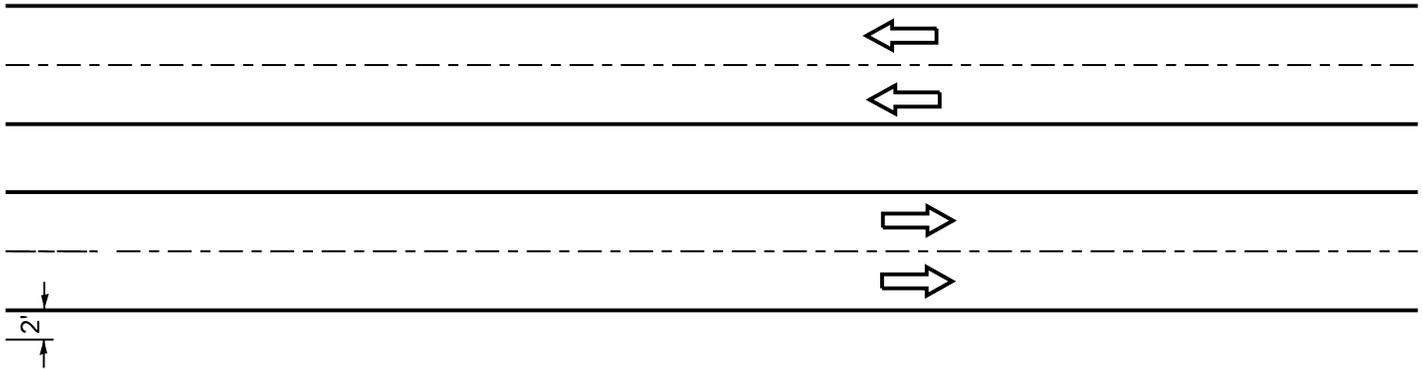
Note:
Cones at 20 ft centers on taper and
at 50 ft centers along travel way.



First Response: Handle situation per requirements for short term encroachments, if possible.

If not:

1. Call for additional devices/help.
2. Set up fusees and/or reflectorized cones.
3. Position vehicle to warn traffic.
4. Aid situation as possible, as a flagger protect hazard.



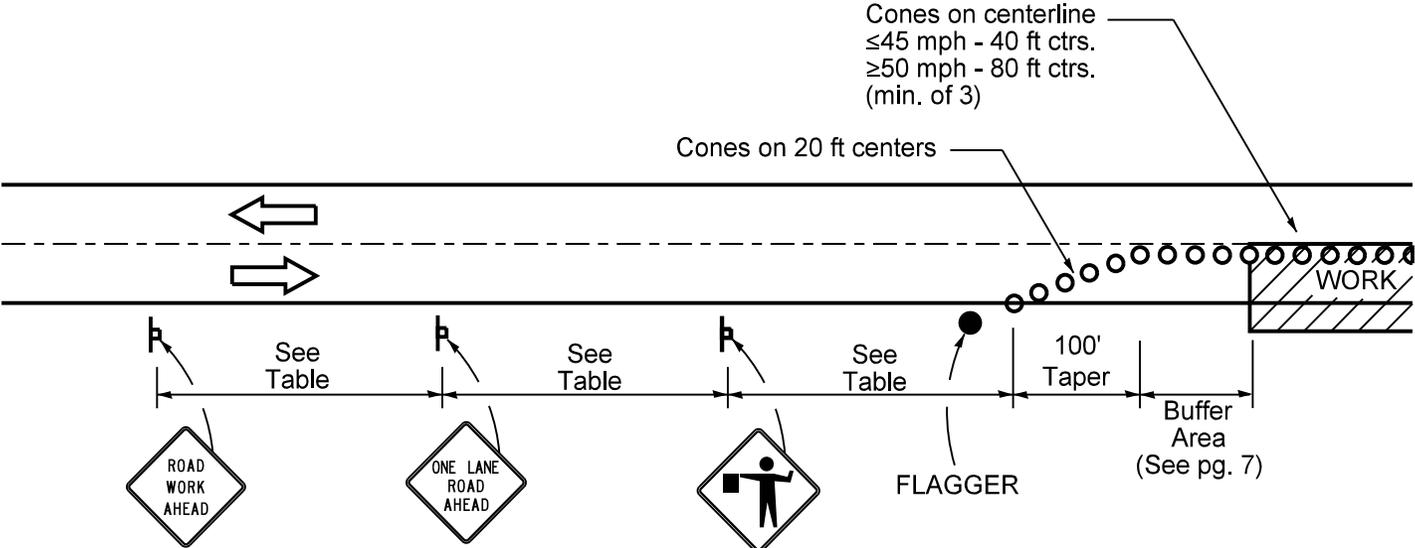
GENERAL NOTES:

1. All vehicles with strobe/warning lights operating.
2. If >2 ft off shoulder, vehicle to set on shoulder with strobe/warning lights operating.
3. Reflectorized cones or fusees are required after 15 minutes.
4. For emergency call outs, when lane closure will be in place for more than 2 hours, a full lane closure should be installed. Inform District Dispatcher or Station One of situation.

G. Two-Lane, Two-Way Roads

1. WZ 21, WZ 22, WZ 23, WZ 24 and WZ 30
2. Intersections (WZ 91)

**ALL SPEEDS
NON-MOVING OPERATION
NO TIME LIMIT**



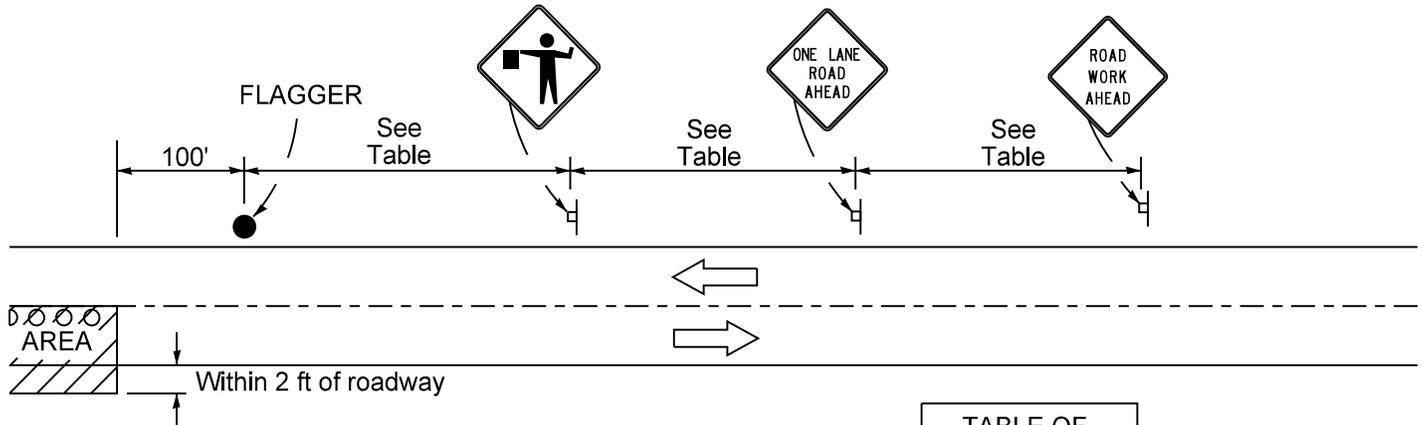
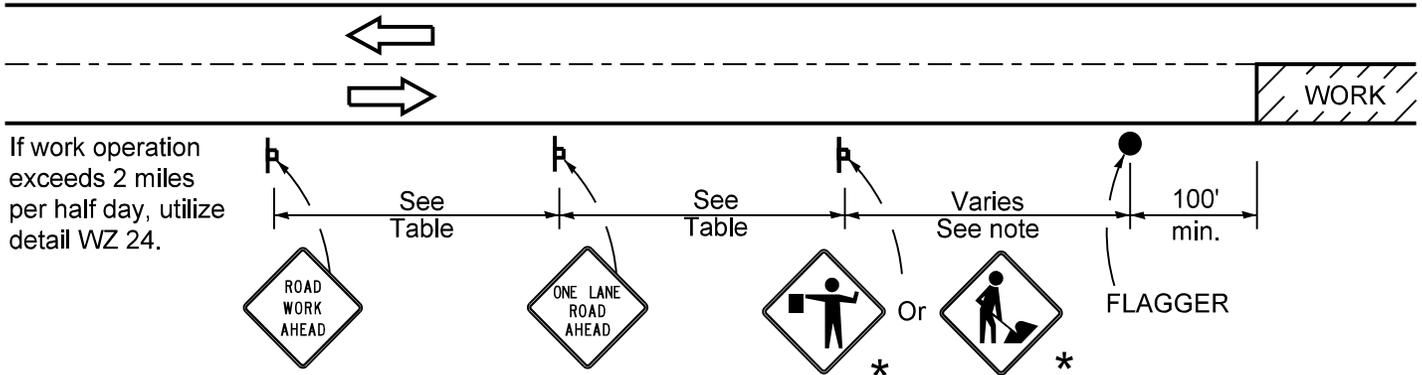


TABLE OF SIGN SPACING	
SPEED MPH	LENGTH
55	500'
45-50	350'
≤40	100'

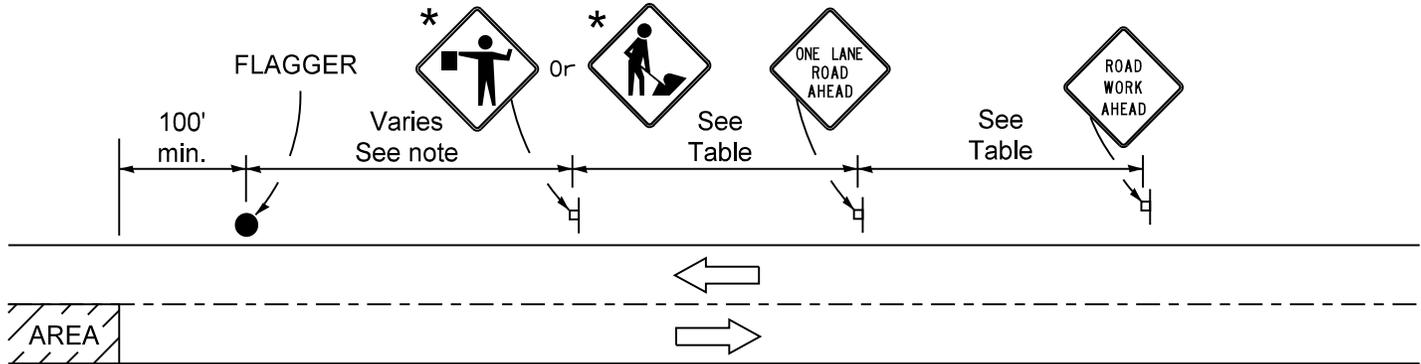
**ALL SPEEDS
MOVING OPERATION
NO TIME LIMIT**

TMA PLACEMENT TABLE	
SPEED	DISTANCE
50-55	180'
≤45	120'

* Flaggers used for moving operations are dependent on the travel speed. If the work operation moves too fast for flaggers, the flaggers may be omitted and the FLAGGER signs shall be replaced with WORKER signs. In lieu of flaggers, a protective vehicle with a TMA and an arrow board in CAUTION mode shall be used in advance of the work area. The TMA shall be placed in advance of the work area in accordance with the TMA placement table.



All vehicles operating strobe/warning lights.

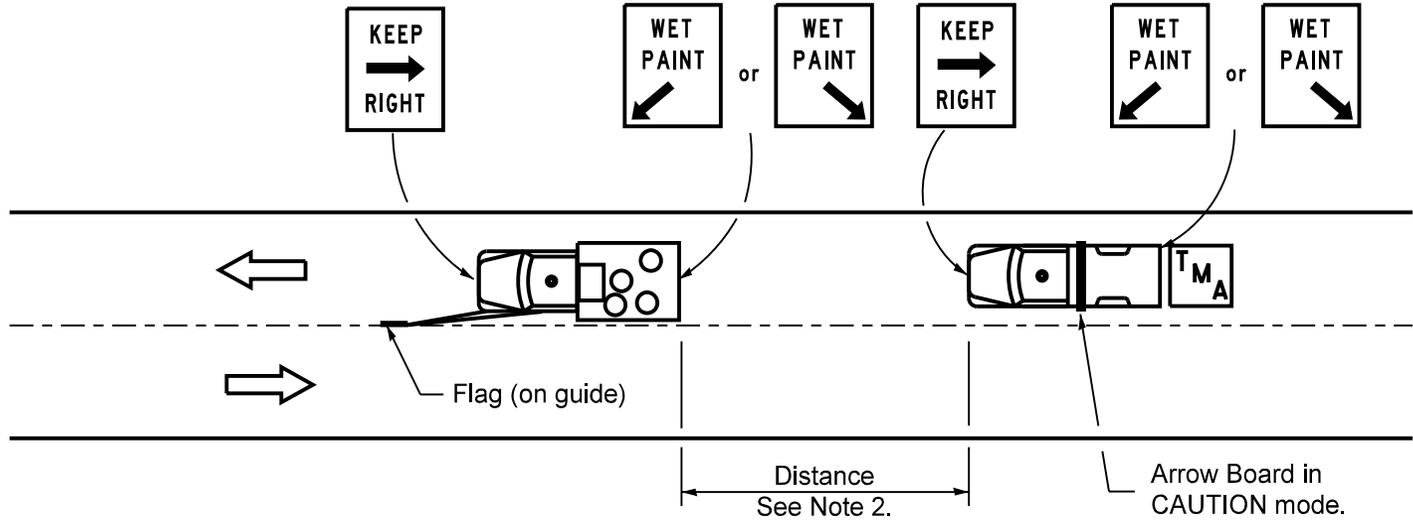


NOTE:
 Minimum distance is 200 ft at Start of Operation. Maximum distance is 2 miles but in no case to exceed one half the distance required for one normal day's operations, whichever is less.

See Flaggers' Guide for flagger instructions and requirements

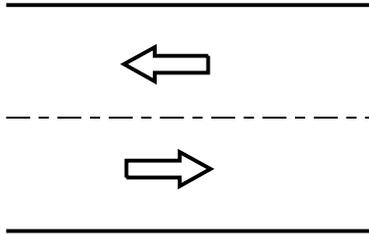
TABLE OF SIGN SPACING	
SPEED MPH	LENGTH
55	500'
45-50	350'
≤40	100'

**ALL SPEEDS
TWO-LANE, TWO-WAY
STRIPING OPERATION**



Notes:

1. Striping machine and all vehicles in convoy (except law enforcement vehicles) are to have headlights operating and are to display amber colored oscillating, rotating, flashing, or strobe/warning lights. At least one amber light is to be visible from any direction.
2. The distance protective vehicles follow the striping machine will vary depending on the terrain and susceptibility of the painted line to wheel tracking. Whenever adequate stopping sight distance exists to rear, the protective vehicle shall maintain minimal distance. The protective vehicle should slow down in advance of vertical and horizontal curves that restrict sight distance.
3. Striping operation may be supported by additional traffic control devices.

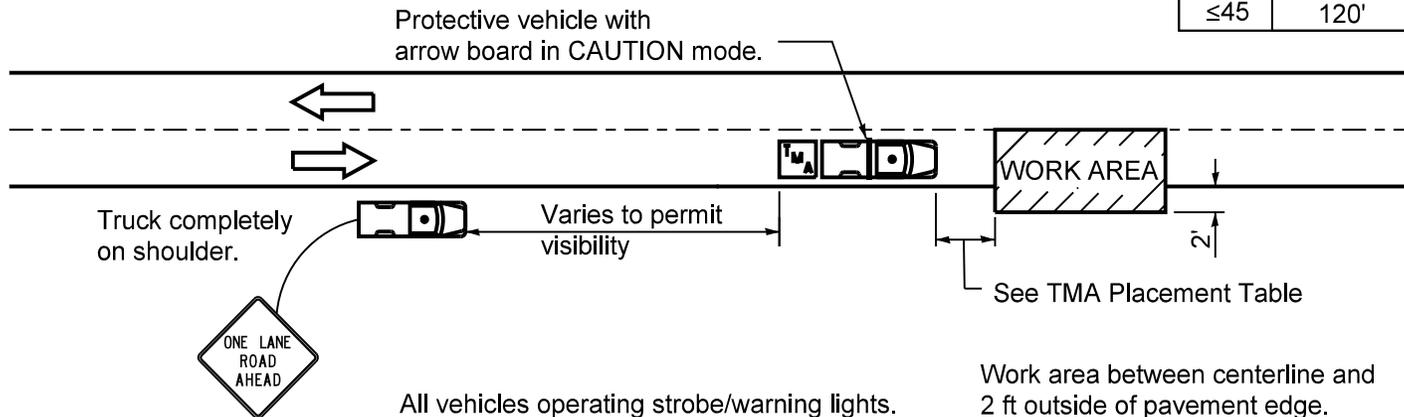


**ALL SPEEDS INTERMITTENT / MOVING
OPERATION TWO-LANE,
TWO-WAY TRAFFIC
OPERATIONS EXCEEDING
2 MILES PER HALF DAY**

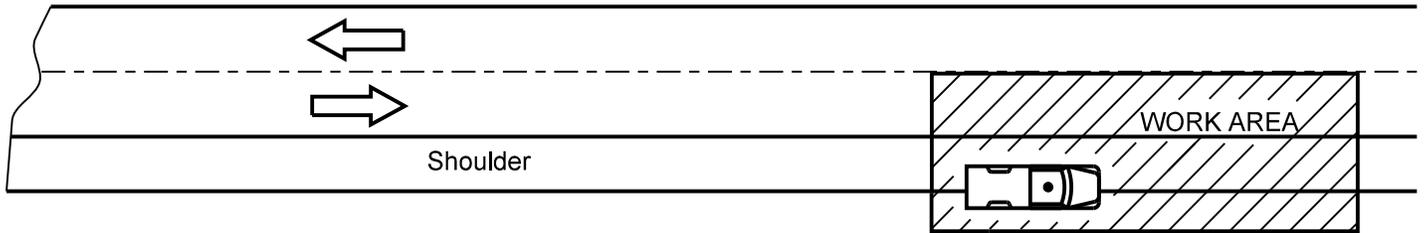
**WZ 24
DAY OR NIGHT**

A protective vehicle with a TMA and an arrow board in CAUTION mode shall be used in advance of the work area. The TMA shall be placed in advance of the work area in accordance with the TMA placement table.

TMA PLACEMENT TABLE	
SPEED	DISTANCE
50-55	180'
≤45	120'



**DAYTIME-ALL SPEEDS
BRIEF ENCROACHMENT
2 LANE ROADWAY
LESS THAN 5,000 ADT**

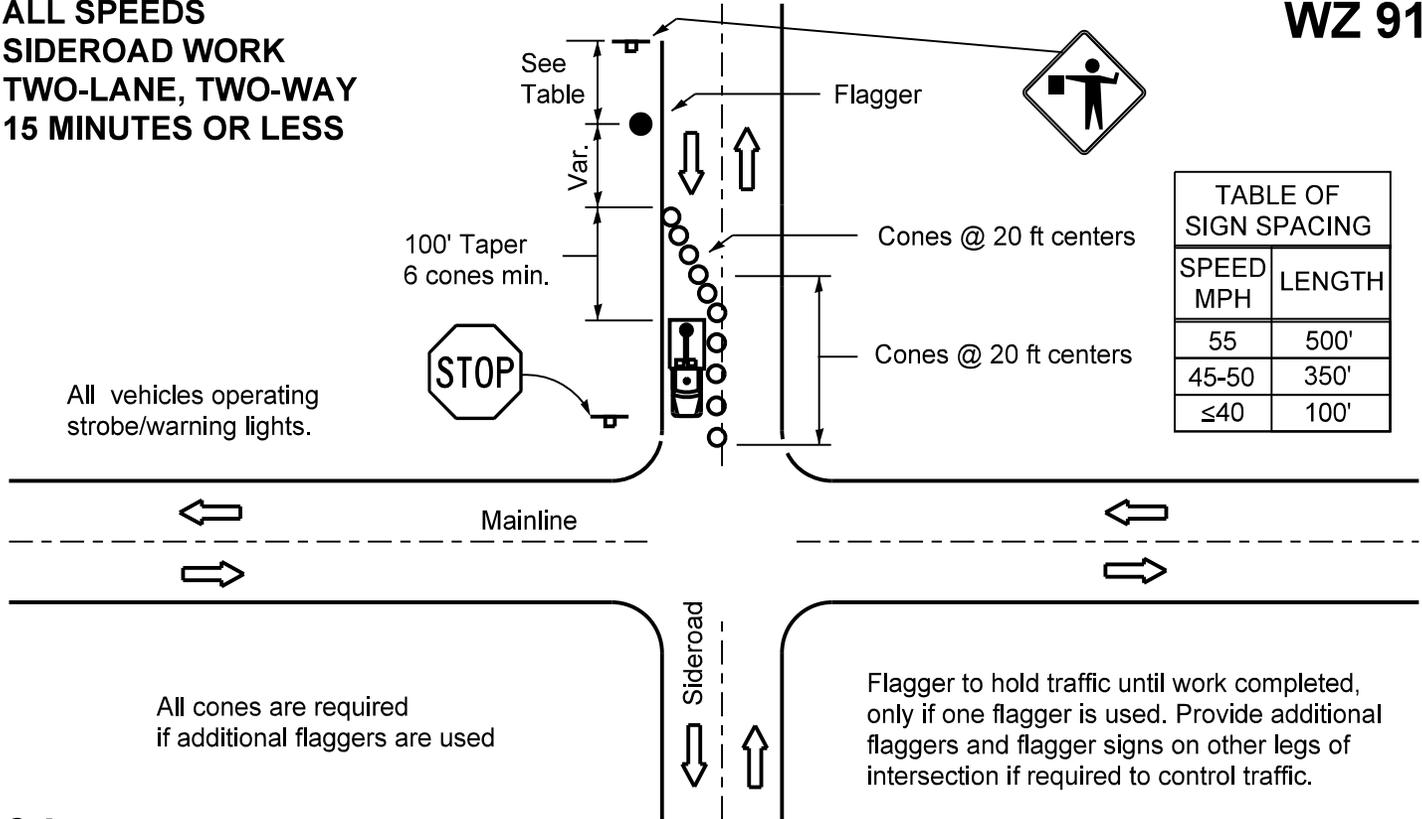


All vehicles operating strobe/warning lights.

- A. May be performed without a flagger, provided all vehicles are completely off traveled lanes:
1. Each task must be performed with extreme care.
 2. The amount of time the workers are on the pavement shall be minimized.
 3. Workers shall enter onto the pavement only during appropriate gaps in traffic.
 4. Adequate sight distance must be available to utilize this case.
 5. If workers must remain in traffic lane and appropriate gaps do not exist, the lane must be closed with proper traffic control signs and devices.
 6. Vehicle may not encroach onto the pavement.
 7. When possible, work on the same side of road as the vehicle.
 8. Employee shall wear approved high visibility apparel.
 9. Vehicle shall have its strobe/warning lights on.
- B. No attempts shall be made to stop, slow, or direct traffic into another lane except by a properly trained and equipped flagger with proper warning signs in place.
- C. When it is necessary for the vehicle to stop on the roadway, traffic control shall be in accordance with the proper case.
- D. This case is only allowed during non-peak traffic.

**ALL SPEEDS
SIDEROAD WORK
TWO-LANE, TWO-WAY
15 MINUTES OR LESS**

WZ 91



H. Multilane Undivided Roads

1. WZ 40, WZ 50, WZ 51, and WZ 52
2. Intersections (WZ 92, WZ 94, WZ 95, and WZ 95a)

ALL SPEEDS MULTILANE UP TO 60 MINUTES

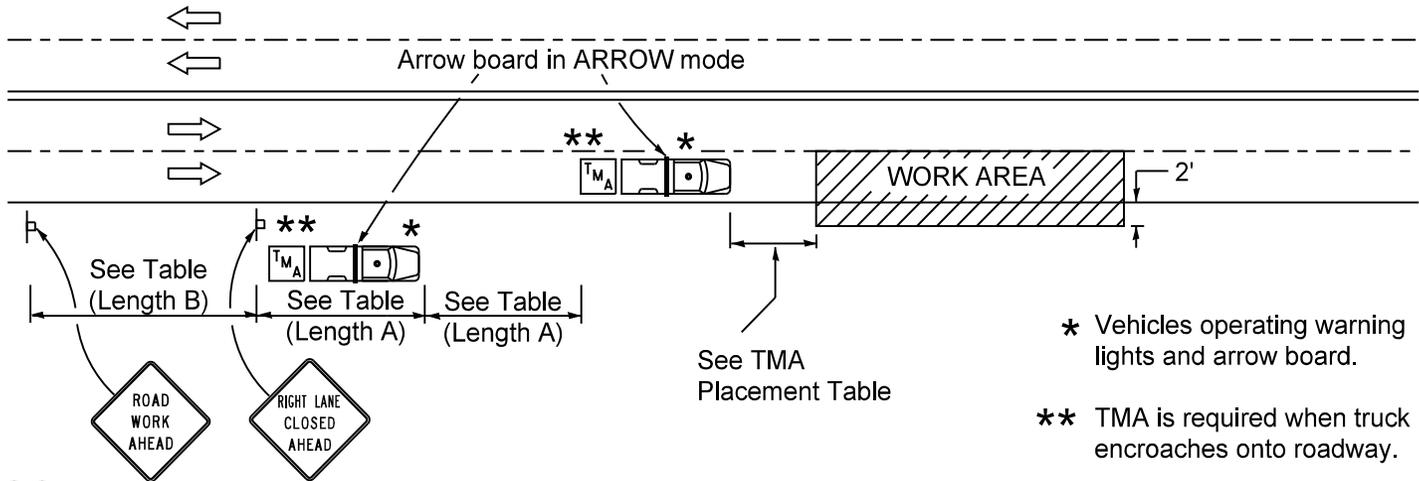
For left lane closure use corresponding left lane information. If median > 10 ft, signs are required in median.

Less than 15 minutes, both shoulder truck and signs optional. 15 to 60 minutes, either shoulder truck or signs shall be utilized.

WZ 40

TABLE OF SIGN SPACING		
SPEED MPH	LENGTH	
	A	B
65-70	1000'	1600'
55-60	500'	500'
45-50	350'	350'
≤40	100'	100'

TMA PLACEMENT TABLE	
SPEED	DISTANCE
60-70	120'
50-55	100'
≤45	80'

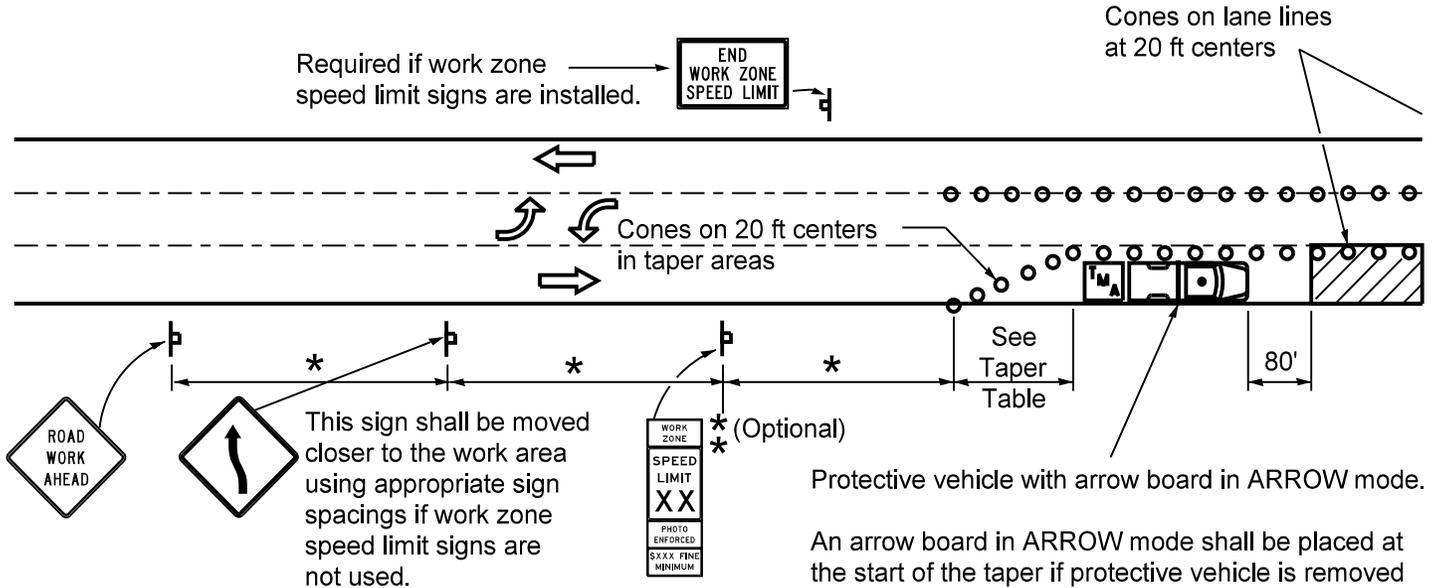


* Vehicles operating warning lights and arrow board.

** TMA is required when truck encroaches onto roadway.

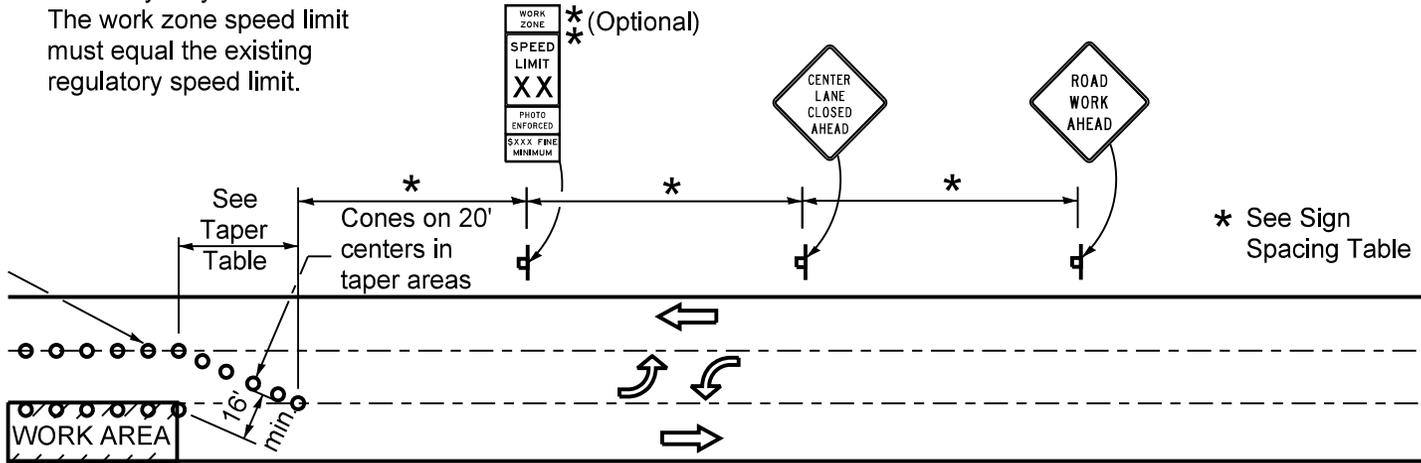
**45 MPH OR LESS
 BI-DIRECTIONAL TURN LANE USED AS THRU LANE
 NO TIME LIMIT
 UP TO 60 MINUTES, NO SIGNS REQUIRED
 FOR MORE THAN 60 MINUTES, SIGNS REQUIRED**

* See Sign Spacing Table



WZ 50

* A work zone speed limit assembly may be installed.
 * The work zone speed limit must equal the existing regulatory speed limit.



* See Sign Spacing Table

END WORK ZONE SPEED LIMIT
 Required if work zone speed limit signs are installed.

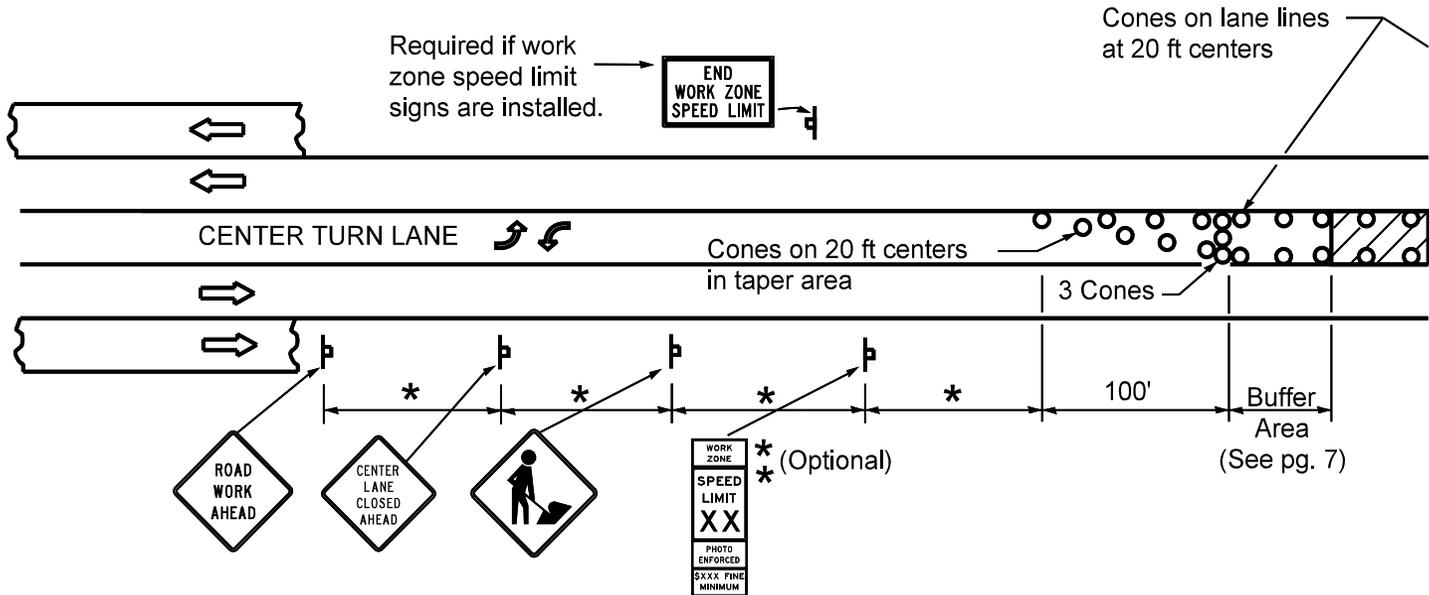
SPEED MPH	LENGTH
45	270'
40	170'
35	125'
30	90'

SPEED MPH	LENGTH
45	350'
≤40	100'

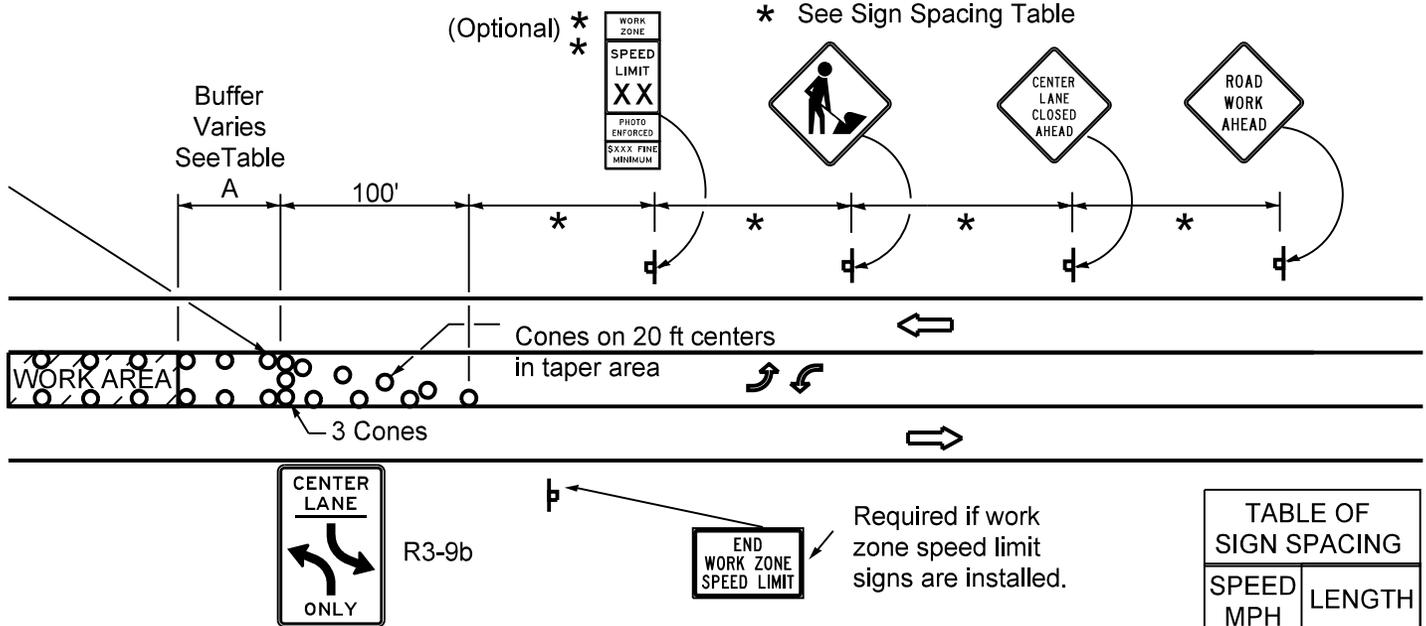
All vehicles operating strobe/warning lights

45 MPH OR LESS
BI-DIRECTIONAL TURN LANE CLOSURE
NO TIME LIMIT
UP TO 60 MINUTES, NO SIGNS REQUIRED
FOR MORE THAN 60 MINUTES, SIGNS REQUIRED

- * A work zone speed limit assembly
- * may be installed. The work zone speed limit must equal the existing regulatory speed limit.

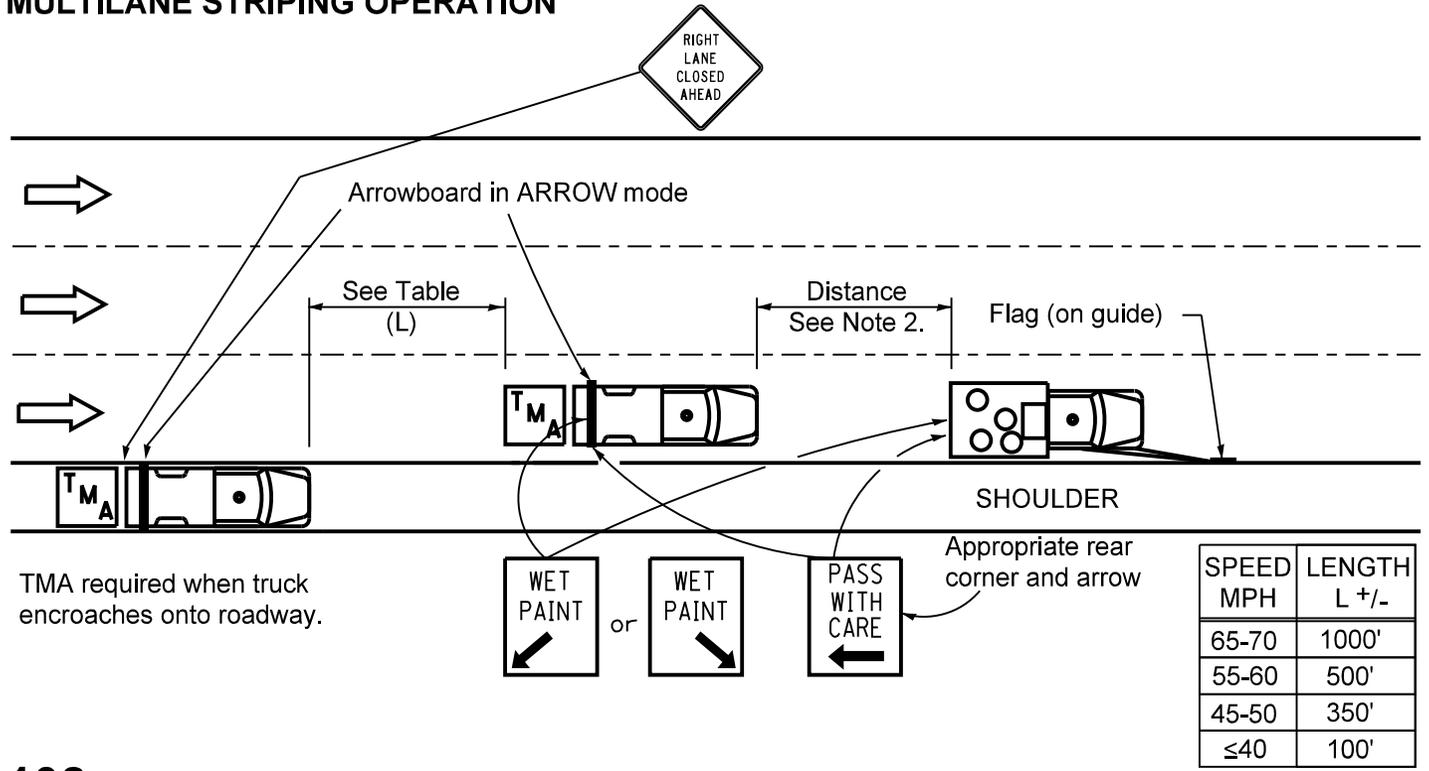


WZ 51



If operational problems are evident and caused by left-turning vehicles, the R3-9b signs in the immediate area of the work zone should be temporarily covered and/or adjustments made in the lengths of the work area, buffer areas and tapers. All dimensions shown may be increased.

ALL SPEEDS MULTILANE STRIPING OPERATION



SPEED MPH	LENGTH L +/-
65-70	1000'
55-60	500'
45-50	350'
≤40	100'

Notes:

WZ 52

1. Striping machine and all vehicles in convoy (except law enforcement vehicles) are to have headlights and strobe/warning lights operating. Strobe/warning lights are to be visible from any direction.
2. Distance protective vehicle(s) follows striping machine will vary depending on terrain and susceptibility of painted line to wheel tracking, whenever adequate stopping sight distance exists to rear, the protective vehicle shall maintain minimal distance. The protective vehicle should slow down in advance of vertical and horizontal curves that restrict sight distance.
3. Striping operation may be supported by additional traffic control devices.

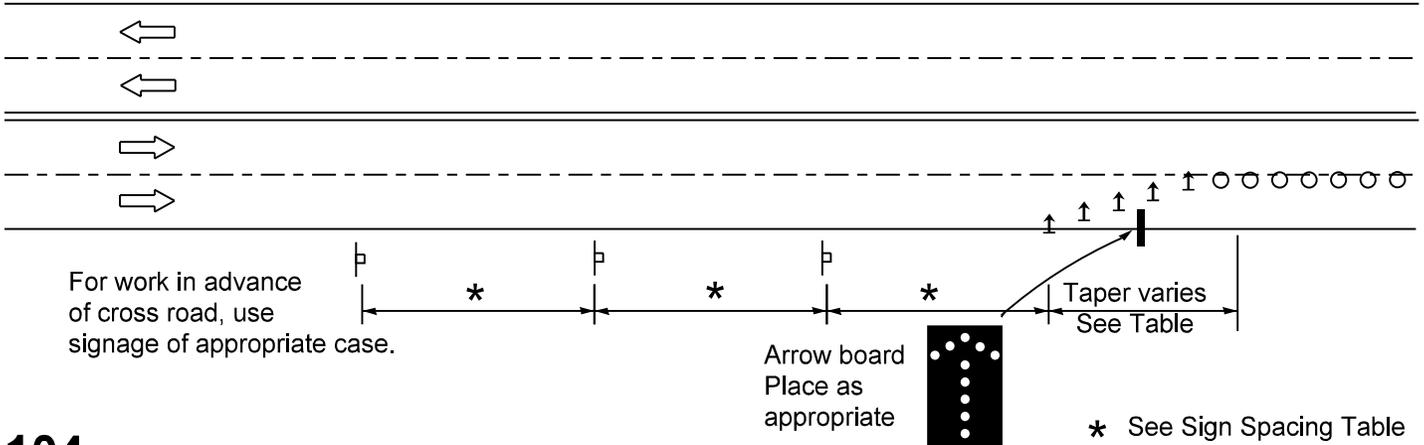
**55 MPH OR LESS
INTERSECTION
NO TIME LIMIT**

TABLE OF SIGN SPACING	
SPEED MPH	LENGTH
55	500'
45-50	350'
≤40	100'

↑ Direction Indicator Barricades:
 ≤ 35 mph - 20 ft centers
 ≥ 40 mph - 40 ft centers

Cones on Lane Line:
 ≤ 35 mph - 40 ft centers
 ≥ 40 mph - 80 ft centers

Cones may be substituted for direction indicator barricades for speeds less than 45 mph.



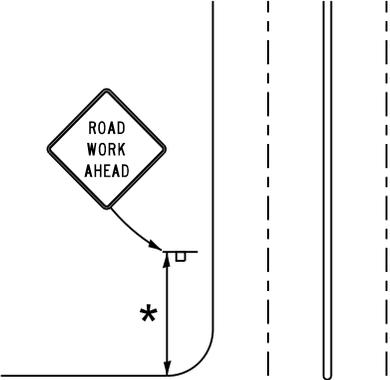
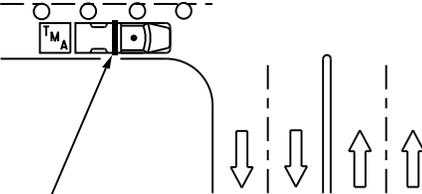
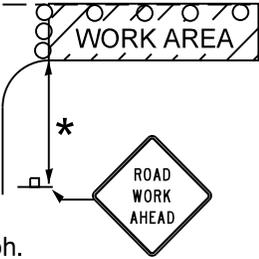


TABLE OF TAPER LENGTH	
SPEED MPH	LENGTH
55	660'
50	600'
45	540'
40	320'
35	245'
30	180'

Note: When 150 ft space is available, place protective vehicle in advance of work area.

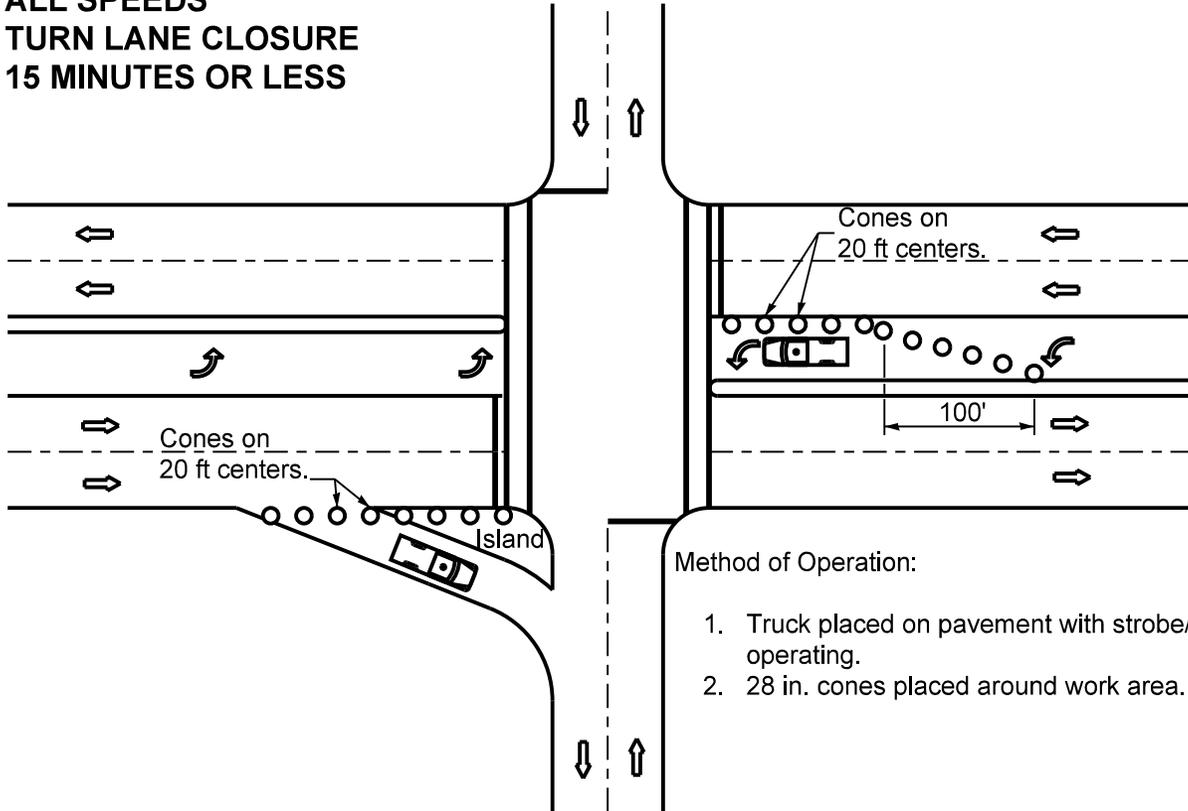


Protective vehicle required for speeds > 40 mph.



If work encroaches into side road, flagger and flagger signs are required.

ALL SPEEDS
TURN LANE CLOSURE
15 MINUTES OR LESS

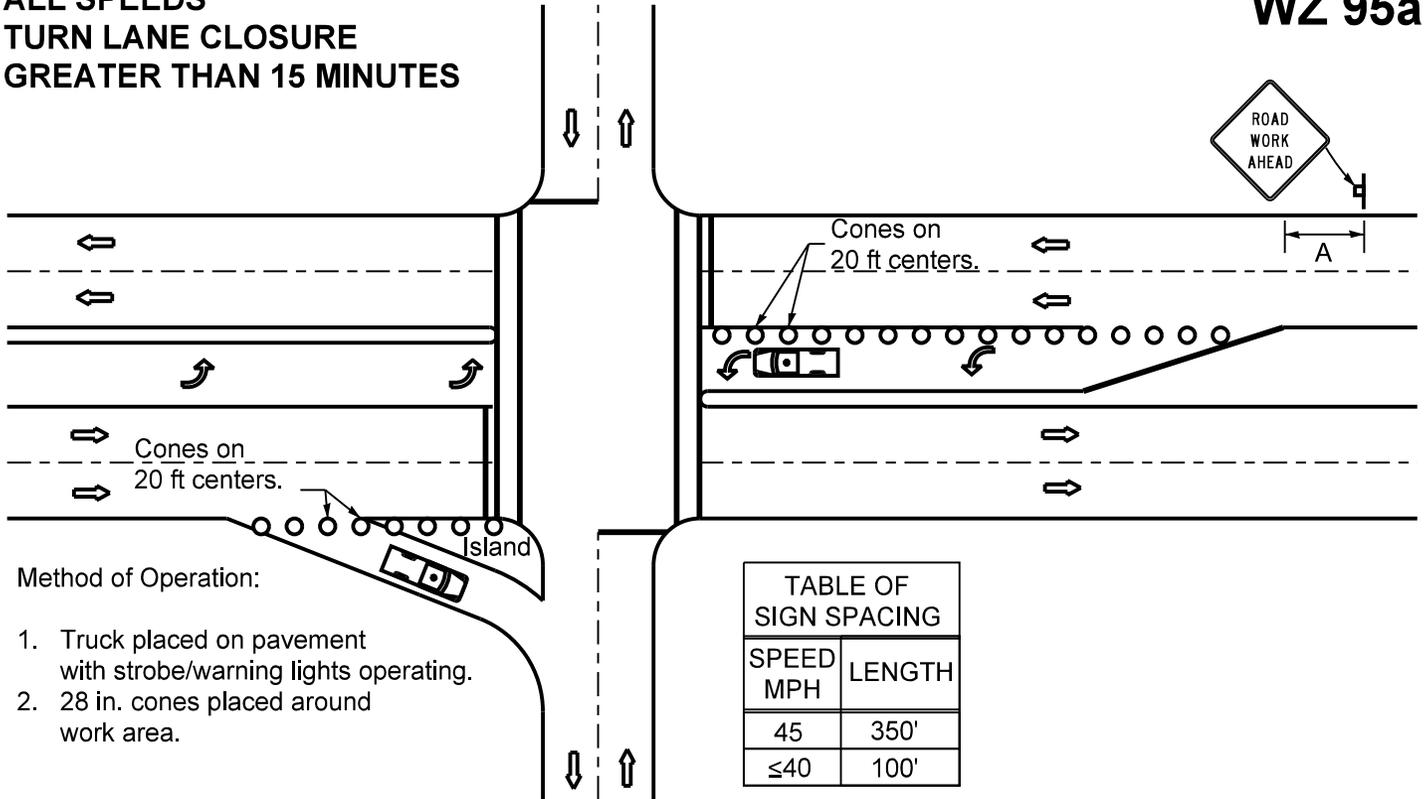


Method of Operation:

1. Truck placed on pavement with strobe/warning lights operating.
2. 28 in. cones placed around work area.

**ALL SPEEDS
TURN LANE CLOSURE
GREATER THAN 15 MINUTES**

WZ 95a



Method of Operation:

1. Truck placed on pavement with strobe/warning lights operating.
2. 28 in. cones placed around work area.

TABLE OF SIGN SPACING	
SPEED MPH	LENGTH
45	350'
≤40	100'

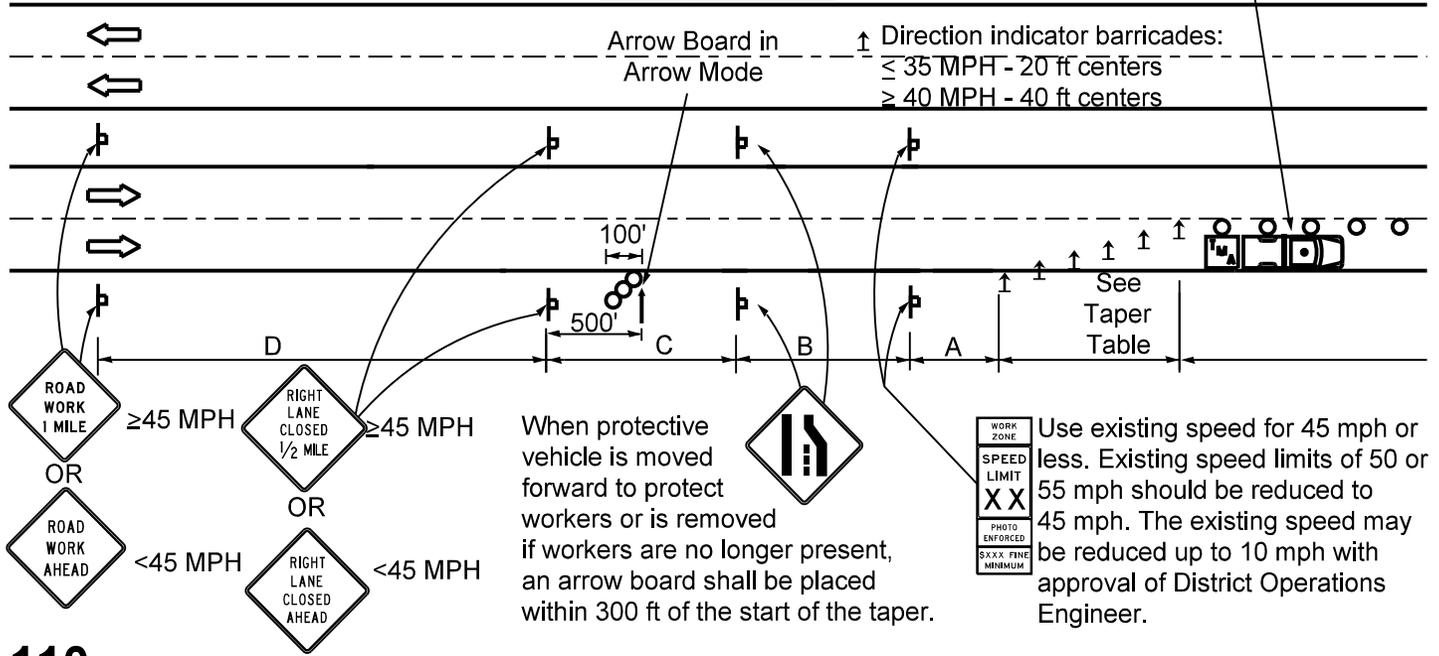
I. Multilane Divided Roads

1. WZ 41, WZ 42, WZ 44, WZ 44a, WZ 45, WZ 45a, WZ 46, WZ 47, WZ 48, WZ 49, WZ 63, WZ 64, WZ 65, and WZ 66
2. Ramps (WZ 60, WZ 61, and WZ 62)
3. Intersections (WZ 93)

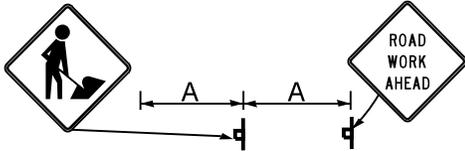
**MULTILANE
LESS THAN OR EQUAL TO 55 MPH
ONE LANE CLOSURE
NO TIME LIMIT**

TMA PLACEMENT TABLE	
SPEED	DISTANCE
50-55	100'
≤45	80'

Protective vehicle with arrow board in ARROW mode, in accordance with TMA placement table.

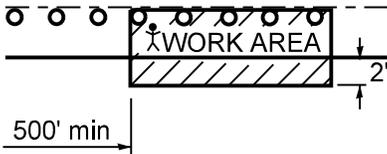
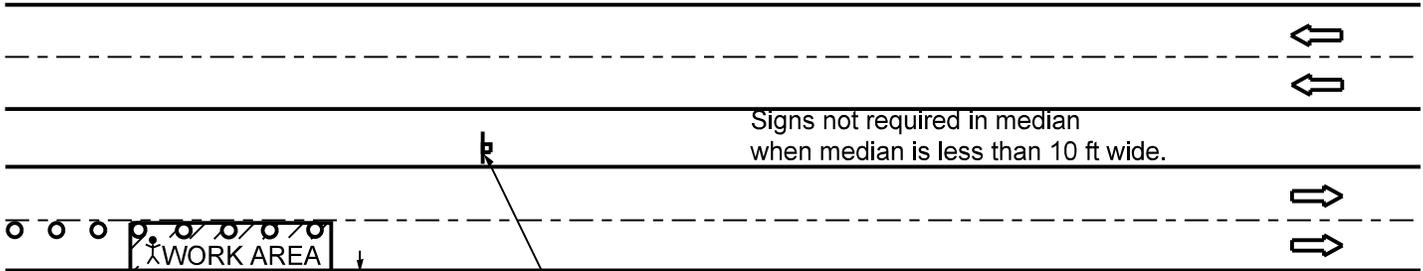


WZ 41



Add these signs when work is being performed in the left lane for an undivided highway.

When work is being performed in the left lane, corresponding left lane information shall be used.



Cones may be substituted for direction indicator barricades for speeds less than 45 MPH

Cones:
 ≤ 35 MPH - 40 ft centers
 ≥ 40 MPH - 80 ft centers

When drums or barricades are used, the spacing may be doubled.



All vehicles operating strobe/warning lights.

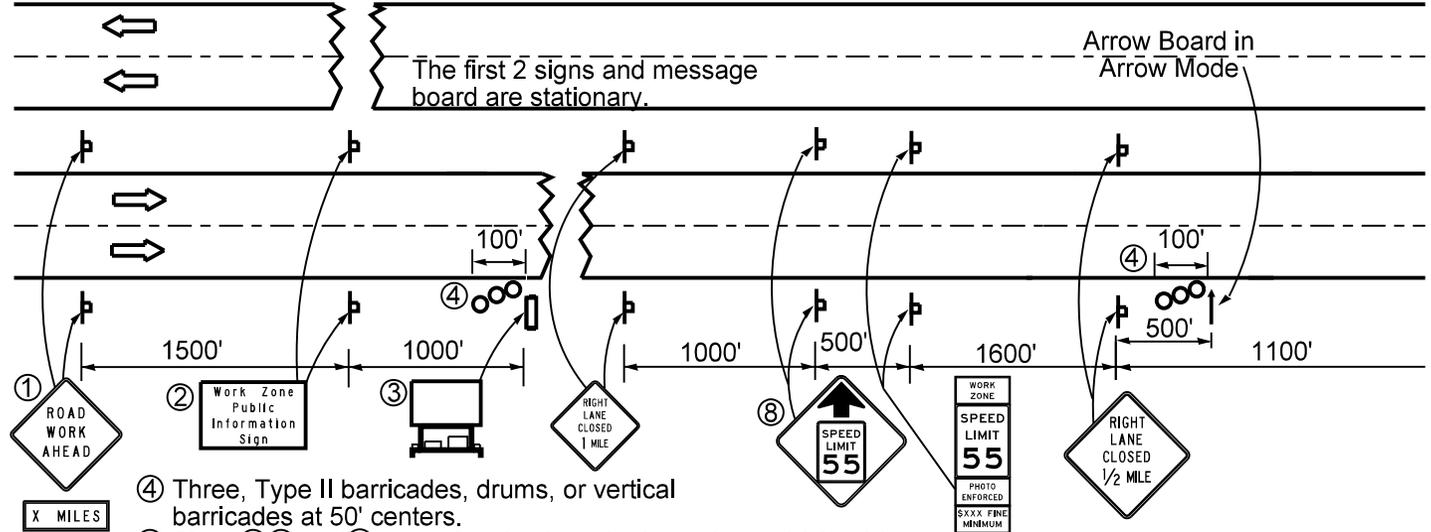
The opposing inside lane should be closed when work is within 2 ft of the centerline.

SPEED MPH	LENGTH			
	A	B	C	D
45-50	500'	1000'	1100'	2600'
≤40	100'	100'	100'	100'

SPEED MPH	LENGTH
55	660'
45	540'
40	320'
35	245'
30	180'

**INTERSTATE
ONE LANE
CLOSURE
NO TIME LIMIT
ANY SPEED**

- ① The Road Work Ahead sign shall be located 3 to 5 miles in advance of the project limits.
- ② The message and size of the Work Zone Public Information sign shall be as specified by the Bureau of Operations.
- ③ The message board shall be used to display status of lane within the project. The primary messages shall be: "All Lanes Open"
"Right Lane Closed"/ "X Miles Ahead"
"Left Lane Closed"/"X Miles Ahead"

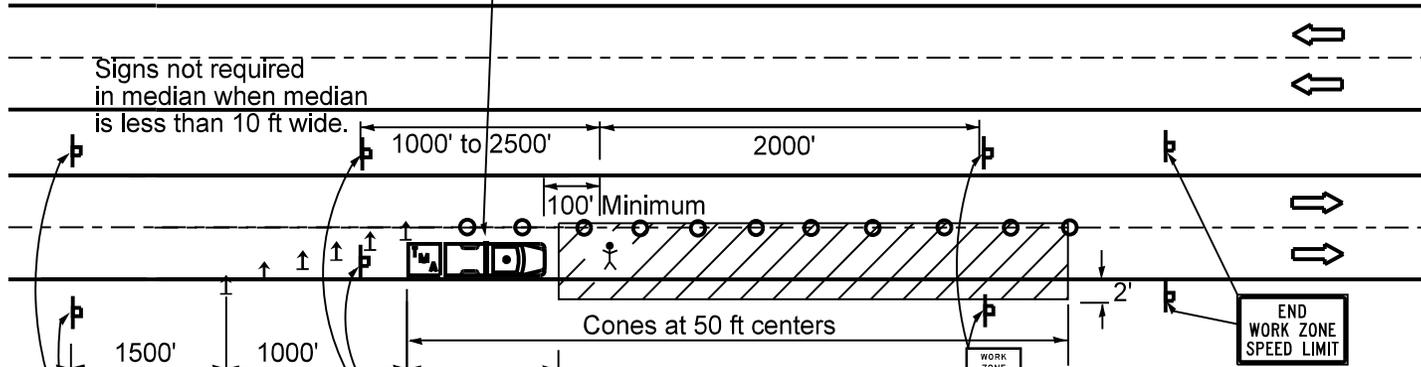


- ④ Three, Type II barricades, drums, or vertical barricades at 50' centers.
- ⑤ Signs ① ② and ③ are optional unless the lane closure(s) last(s) overnight or traffic backups are anticipated.
- ⑥ Work Zone speed limit 45 mph signs shall be moved as necessary to maintain the required spacing between the signs and the workers in each separate work activity.

- ⑦ If signs ①② and ③ are not used, replace the RIGHT LANE CLOSED 1 MILE with ROAD WORK 1 MILE sign.
- ⑧ Only install when preexisting speed limit is 70 mph.

Protective vehicle with arrow board in ARROW mode.

When protective vehicle is moved forward to protect workers, or is removed if workers are no longer present an arrow board shall be placed at the start of the taper.



↑ Direction indicator barricades at 50 ft centers.



TMA-Placed in accordance with TMA placement table.

TMA PLACEMENT TABLE	
SPEED	DISTANCE
60-70	120'
50-55	100'
≤45	80'



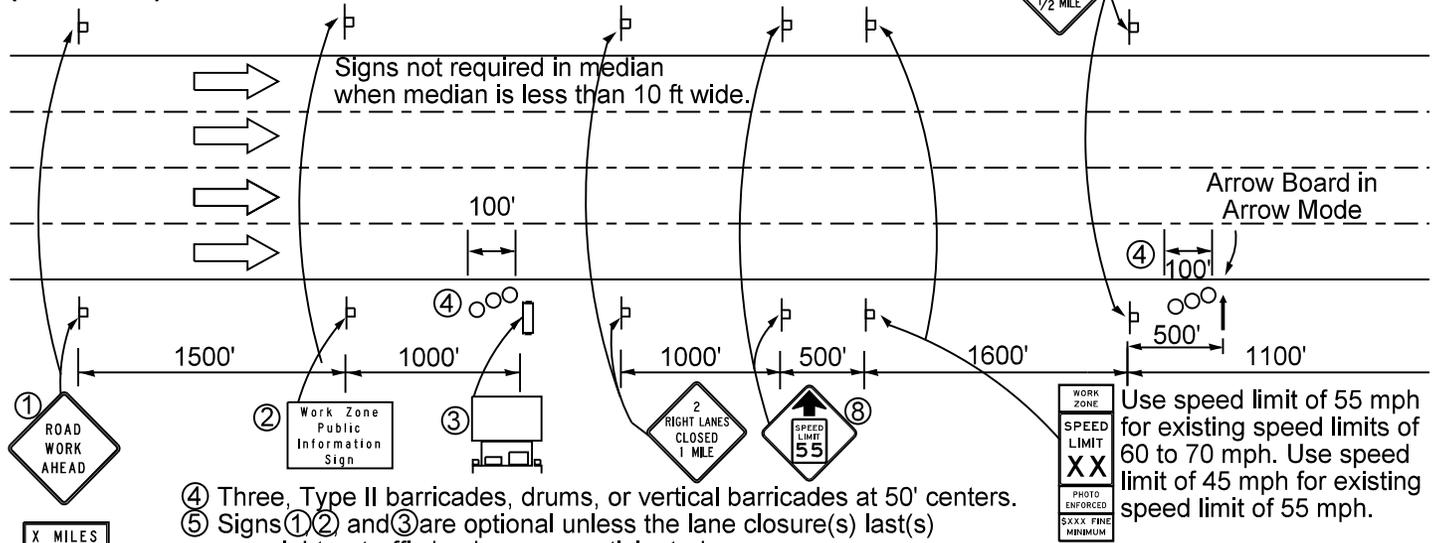
When work is being performed in the left lane, corresponding left lane information shall be used.

55 MPH sign omitted when within 500 ft of End Work Zone Speed Limit sign.

All vehicles operating strobe/warning lights.

**MULTILANE
DIVIDED
TWO LANE
CLOSURE
NO TIME LIMIT
(≥55 MPH)**

- ① The Road Work Ahead sign shall be located 3 to 5 miles in advance of the project limits.
- ② The message and size of the Work Zone Public Information sign shall be as specified by the Bureau of Operations.
- ③ The message board shall be used to display status of lane within the project. The primary messages shall be: "All Lanes Open"
"Right Lane Closed"/"X Miles Ahead"
"Left Lane Closed"/"X Miles Ahead"



Use speed limit of 55 mph for existing speed limits of 60 to 70 mph. Use speed limit of 45 mph for existing speed limit of 55 mph.

WZ 44

- ⑦ If signs ①② and ③ are not used, replace the RIGHT LANE CLOSED 1 MILE with ROAD WORK 1 MILE sign.
- ⑧ Only install when preexisting speed limit is 70 mph.

TMA PLACEMENT TABLE	
SPEED	DISTANCE
60-70	120'
55	100'

When protective vehicle is moved forward to protect workers or is removed if workers are no longer present, an arrow board shall be placed at the start of the taper.

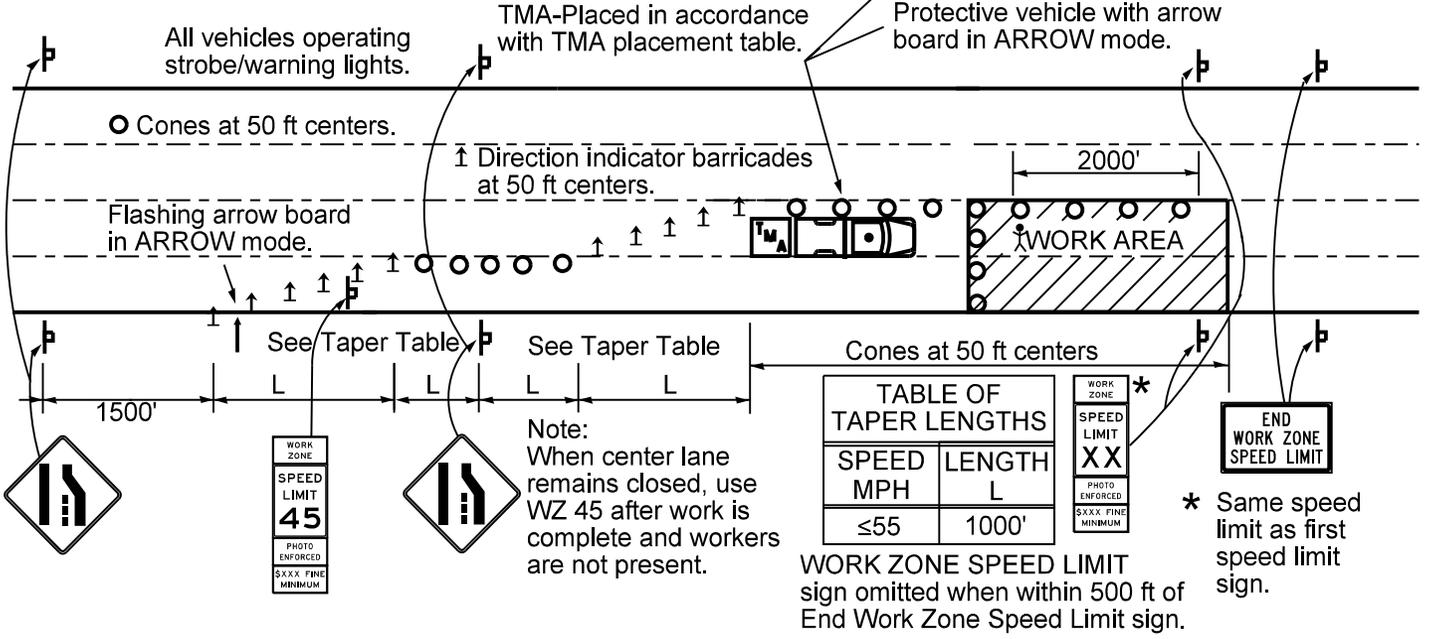


TABLE OF TAPER LENGTHS	
SPEED MPH	LENGTH L
≤55	1000'

WORK ZONE	*
SPEED LIMIT	XX
PHOTO ENFORCED	
\$XXX FINE	MINIMUM

* Same speed limit as first speed limit sign.

WORK ZONE SPEED LIMIT sign omitted when within 500 ft of End Work Zone Speed Limit sign.

**MULTILANE URBAN DIVIDED
TWO LANE CLOSURE
NO TIME LIMIT
(<55 MPH)**

TMA PLACEMENT TABLE	
SPEED	DISTANCE
50	100'
≤45	80'

TABLE OF SIGN SPACING	
SPEED MPH	LENGTH
45-50	350'
≤40	100'

Signs not required in median when median is less than 10 ft wide.

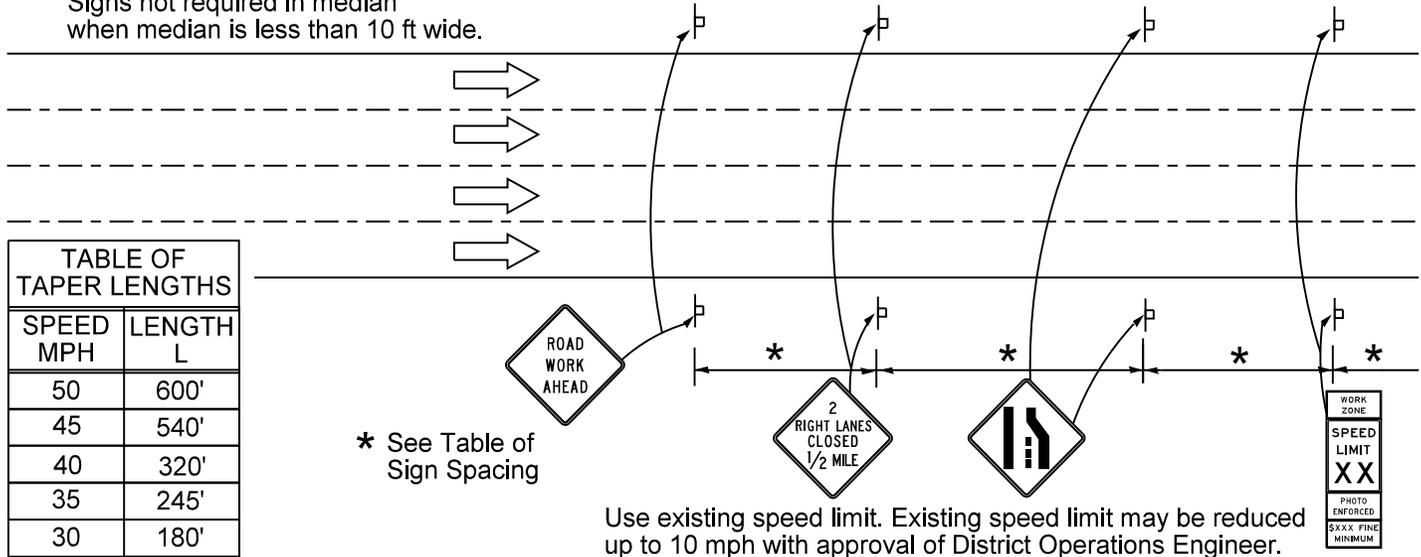


TABLE OF TAPER LENGTHS	
SPEED MPH	LENGTH L
50	600'
45	540'
40	320'
35	245'
30	180'

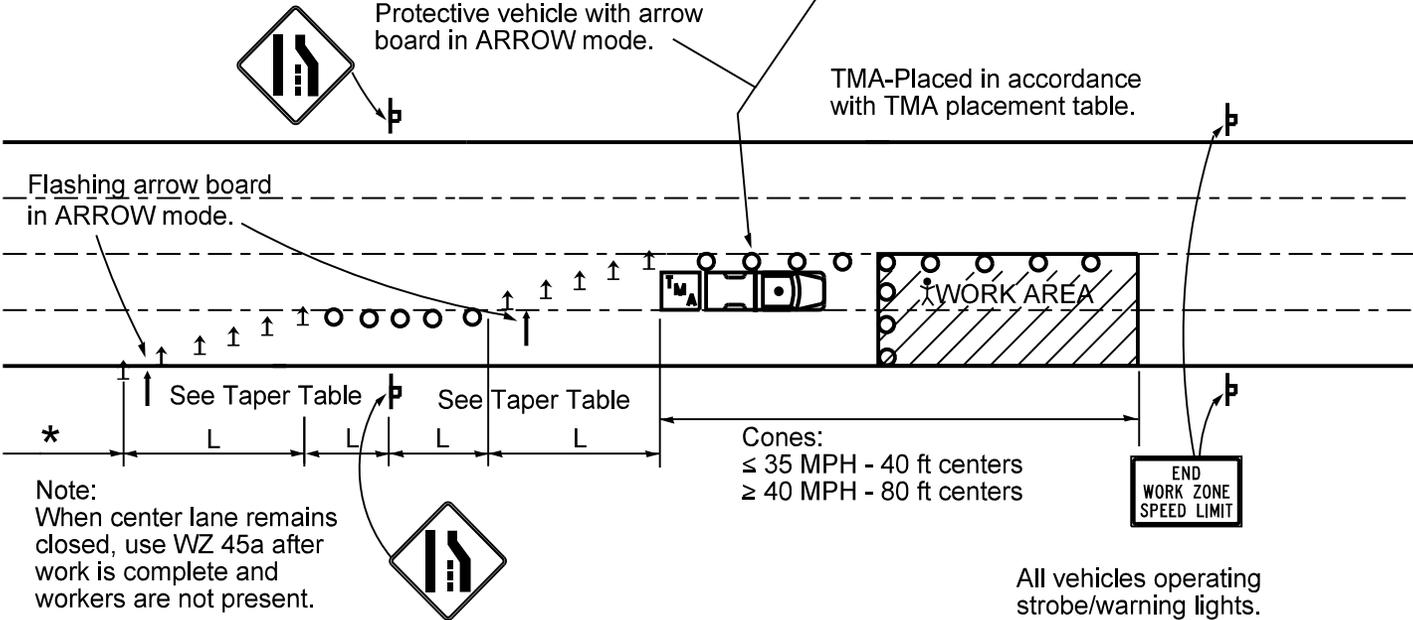
* See Table of Sign Spacing

Use existing speed limit. Existing speed limit may be reduced up to 10 mph with approval of District Operations Engineer.

WZ 44a

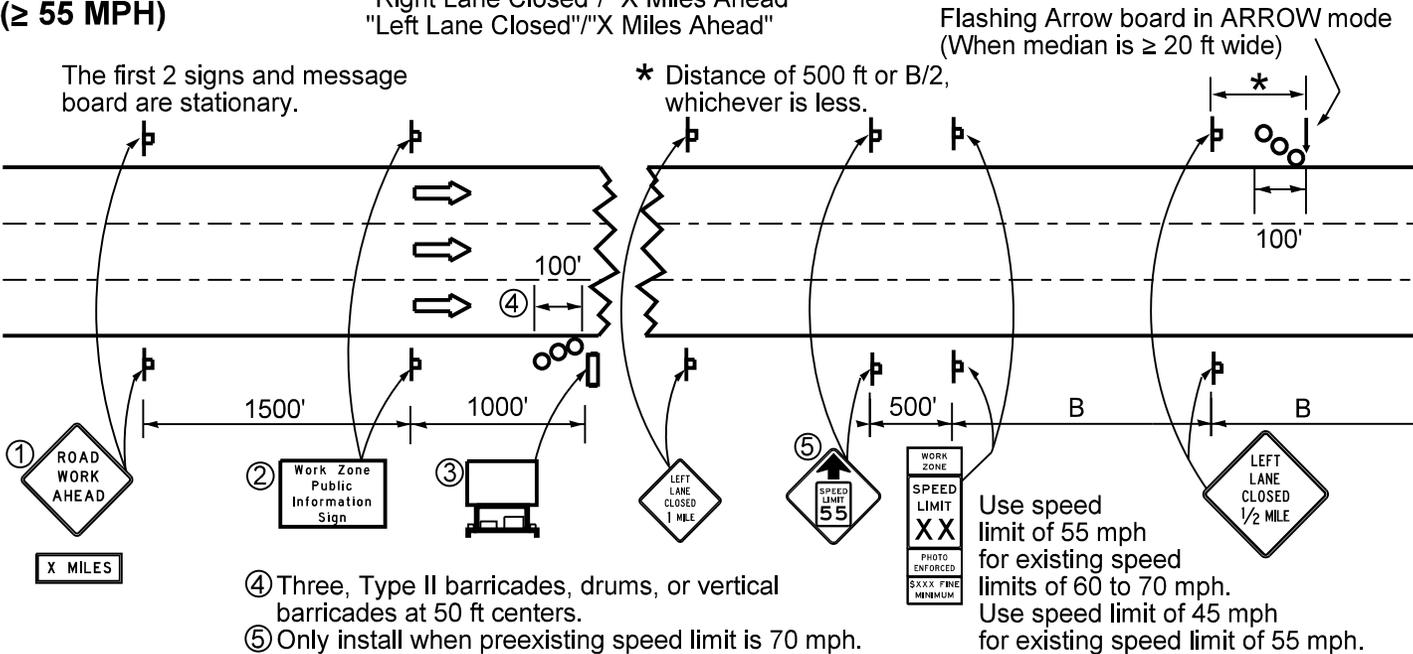
↑ Direction indicator barricades:
 ≤ 35 MPH - 20 ft centers
 ≥ 40 MPH - 40 ft centers

When protective vehicle is moved forward to protect workers or is removed if workers are no longer present, an arrow board shall be placed at the start of the taper.



**CENTER LANE
CLOSURE
NO WORKERS
PRESENT
(≥ 55 MPH)**

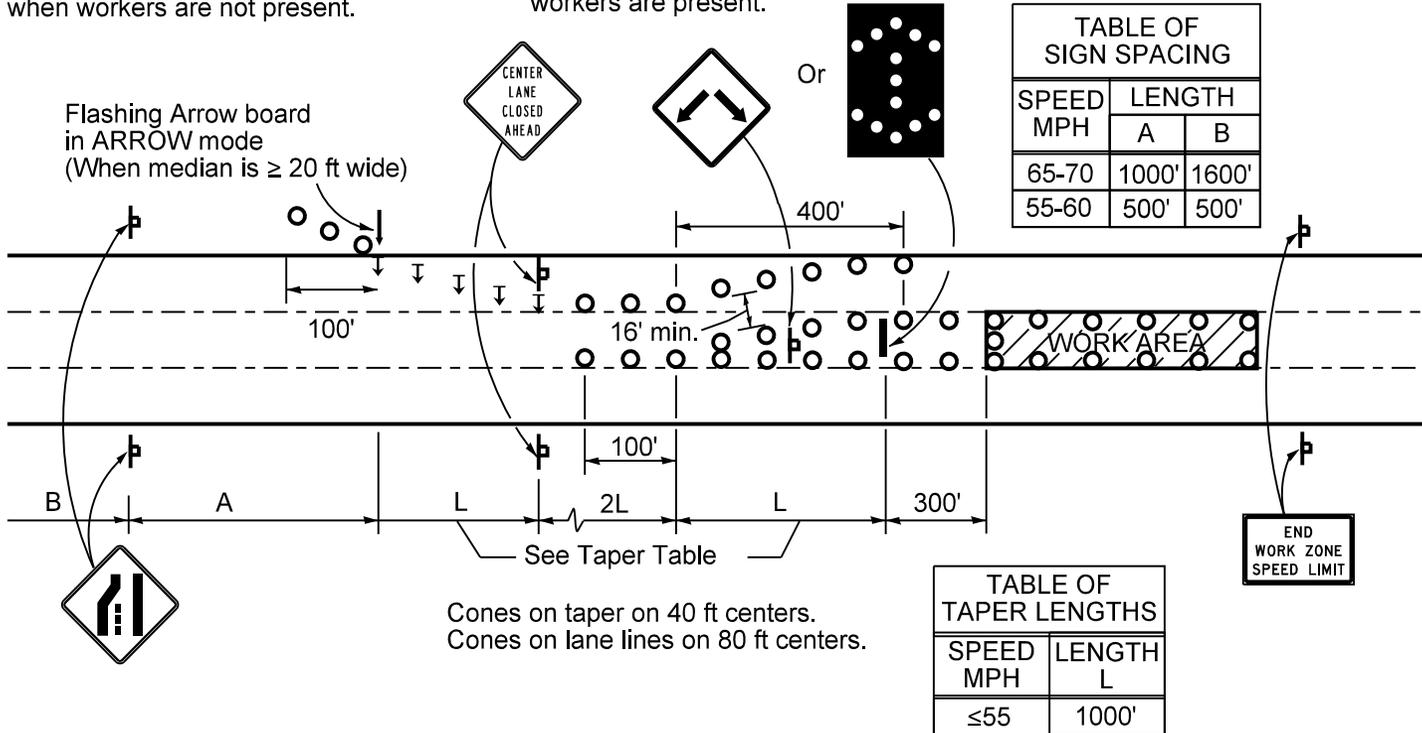
- ① The Road Work Ahead sign shall be located 3 to 5 miles in advance of the project limits.
- ② The message and size of the Work Zone Public Information sign shall be as specified by the Bureau of Operations.
- ③ The message board shall be used to display status of lane within the project. The primary messages shall be: "All Lanes Open"
"Right Lane Closed"/ "X Miles Ahead"
"Left Lane Closed"/"X Miles Ahead"



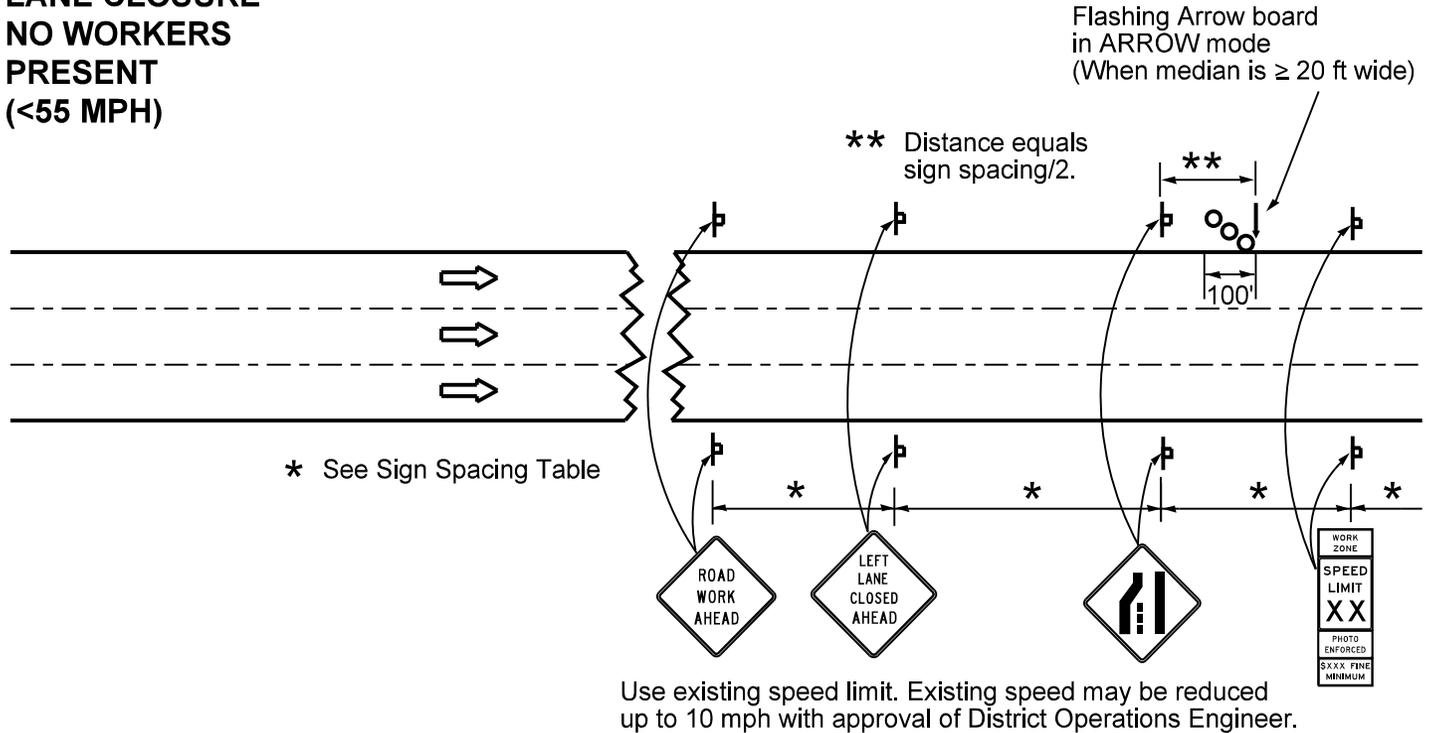
Note:
This case may only be utilized
when workers are not present.

Use WZ 44 while
workers are present.

WZ 45



**URBAN CENTER
LANE CLOSURE
NO WORKERS
PRESENT
(<55 MPH)**



WZ 45a

TABLE OF SIGN SPACING	
SPEED MPH	LENGTH
45-50	350'
≤40	100'

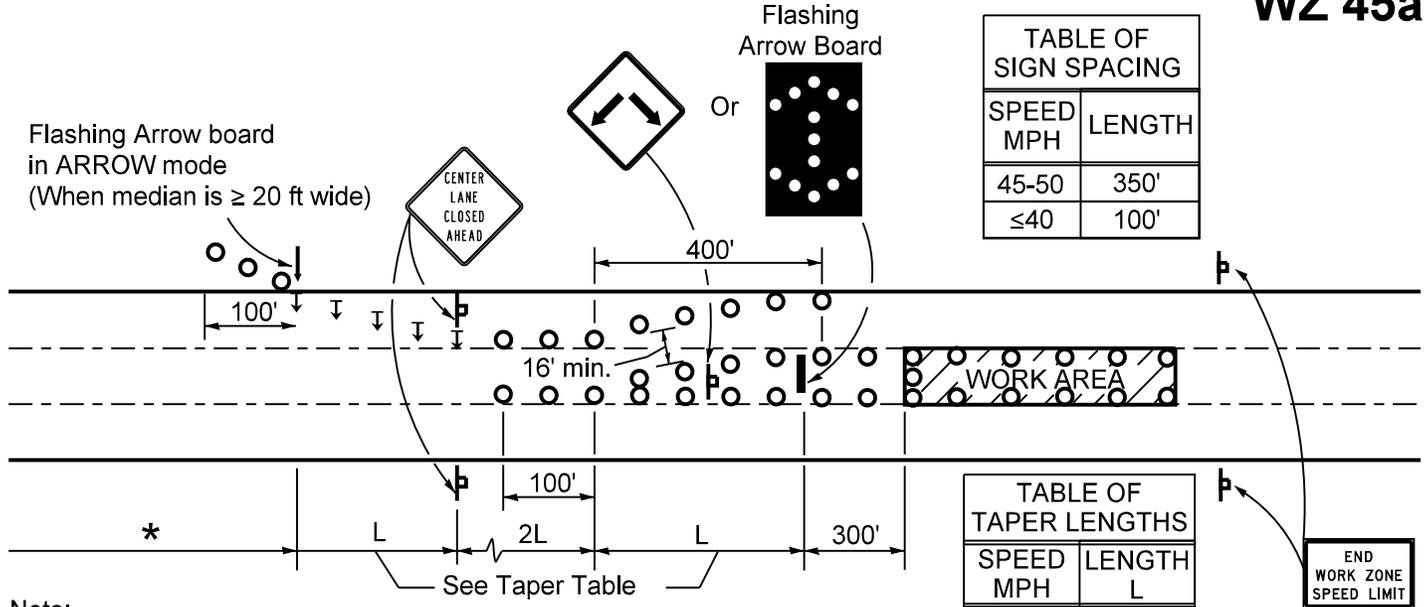


TABLE OF TAPER LENGTHS	
SPEED MPH	LENGTH L
50	600'
45	540'
40	320'
35	245'
30	180'

Note:
This case may only be utilized
when workers are not present.

Use WZ 44 while
workers are present.

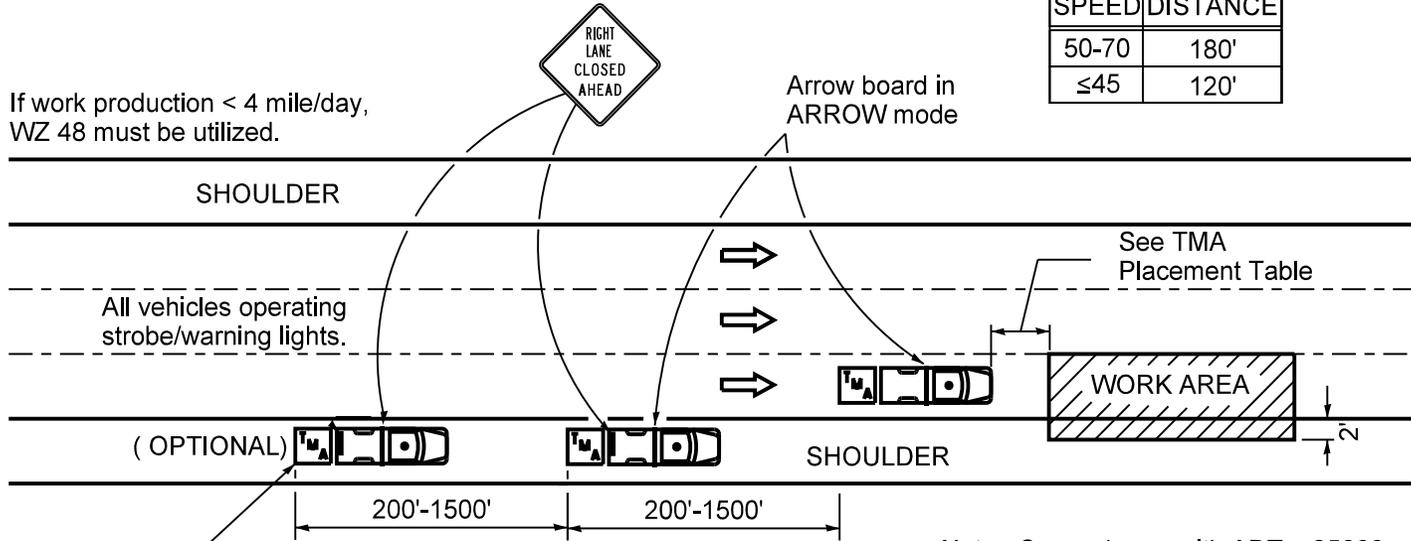
Cones on taper:
≤35 mph - 20 ft ctrs.
≥40 mph - 40 ft ctrs.
Cones on lane lines:
≤35 mph - 40 ft ctrs.
≥40 mph - 80 ft ctrs.

**ALL SPEEDS
INTERMITTENT / MOVING OPERATION
NO TIME LIMIT
MORE THAN 4 MILE PER DAY**

WZ 46

TMA PLACEMENT TABLE	
SPEED	DISTANCE
50-70	180'
≤45	120'

If work production < 4 mile/day, WZ 48 must be utilized.



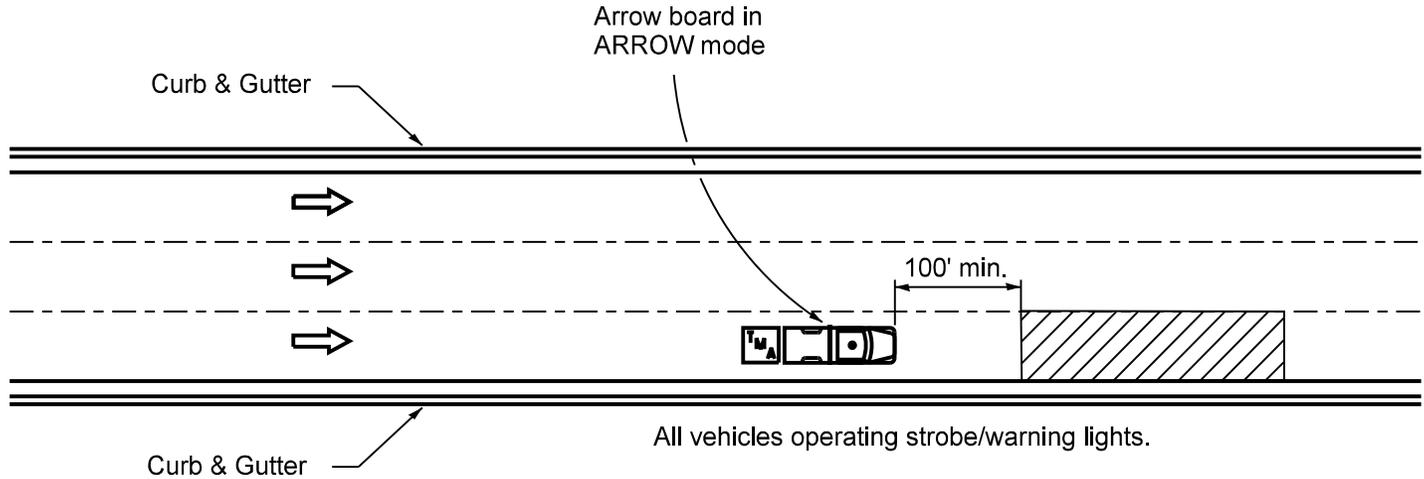
TMA is required when truck encroaches onto roadway.

Shoulder vehicles may straddle edge line where there is inadequate shoulder width.

Note: On roadways with ADT > 25000, all vehicles can travel on shoulder, then move into the traffic lane for intermittent operations such as pothole patching.

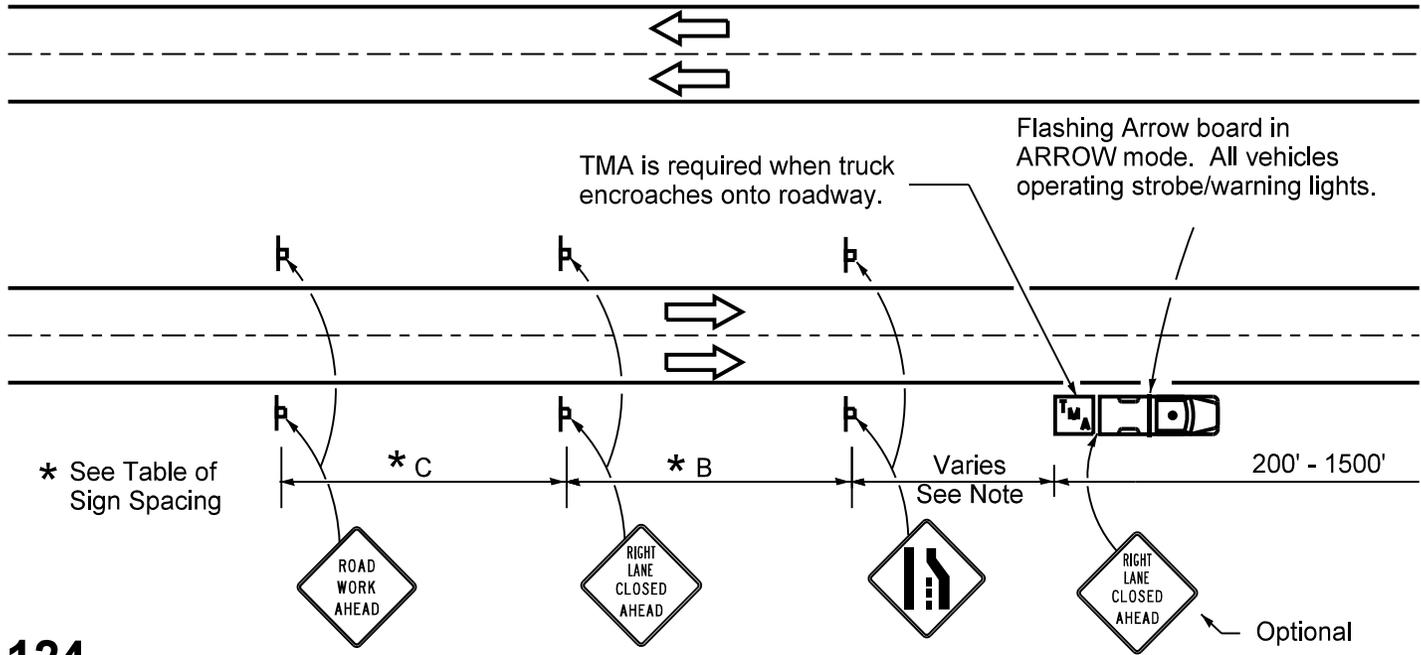
**45 MPH OR LESS
INTERMITTENT / MOVING OPERATION
WITH CURB AND GUTTER
ONE LANE CLOSURE**

WZ 47

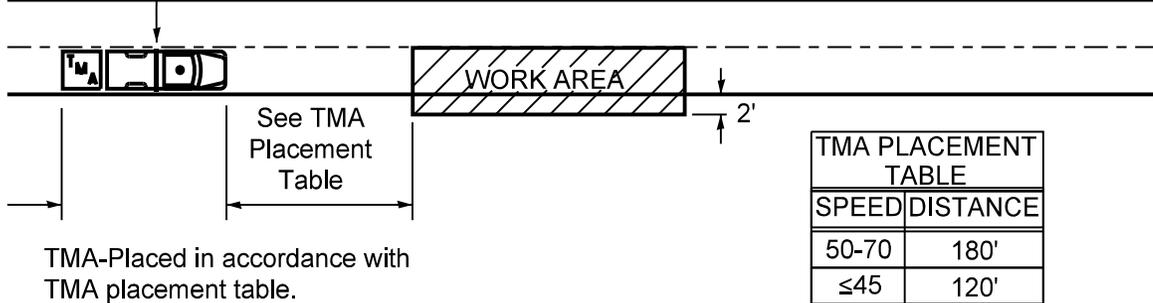
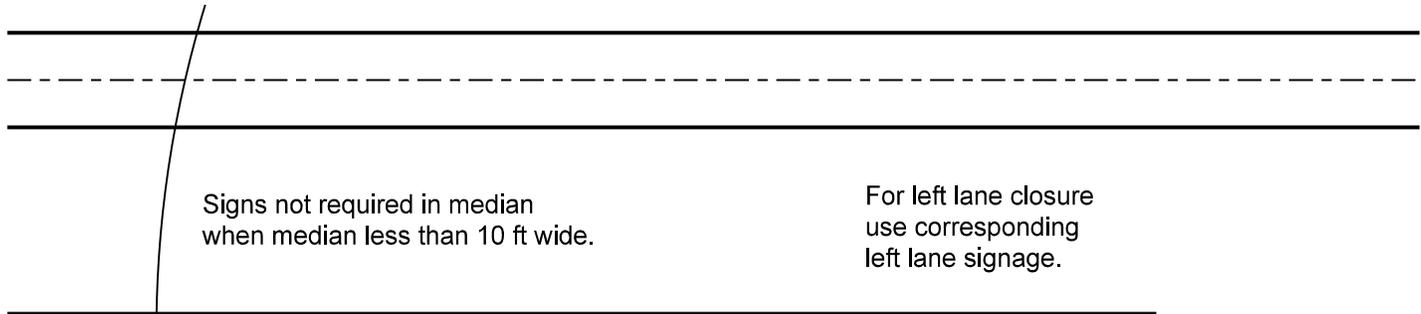


**ALL SPEEDS
 INTERMITTENT / MOVING OPERATION
 NO TIME LIMIT
 LESS THAN 4 MILE PER DAY**

Note:
 Minimum distance is 200 ft at start of operation.
 Maximum distance is two miles, but in no case
 to exceed one half the distance required for one
 day's operations, whichever is less.



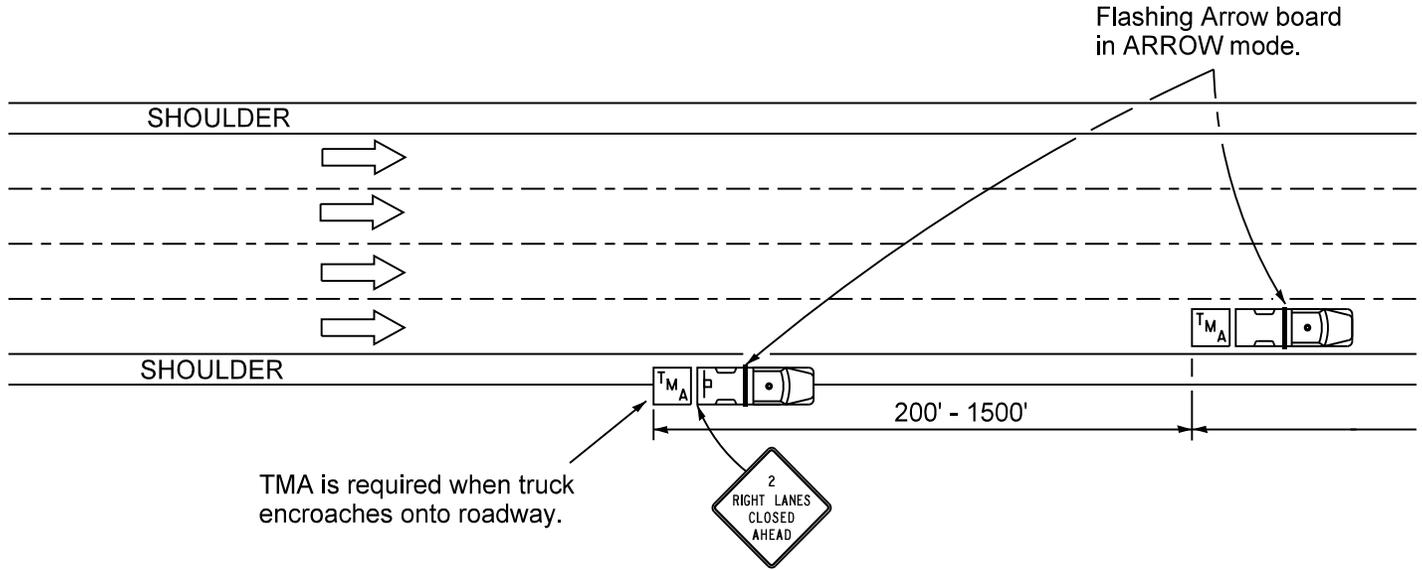
Flashing Arrow board in ARROW mode
 All vehicles operating strobe/warning lights

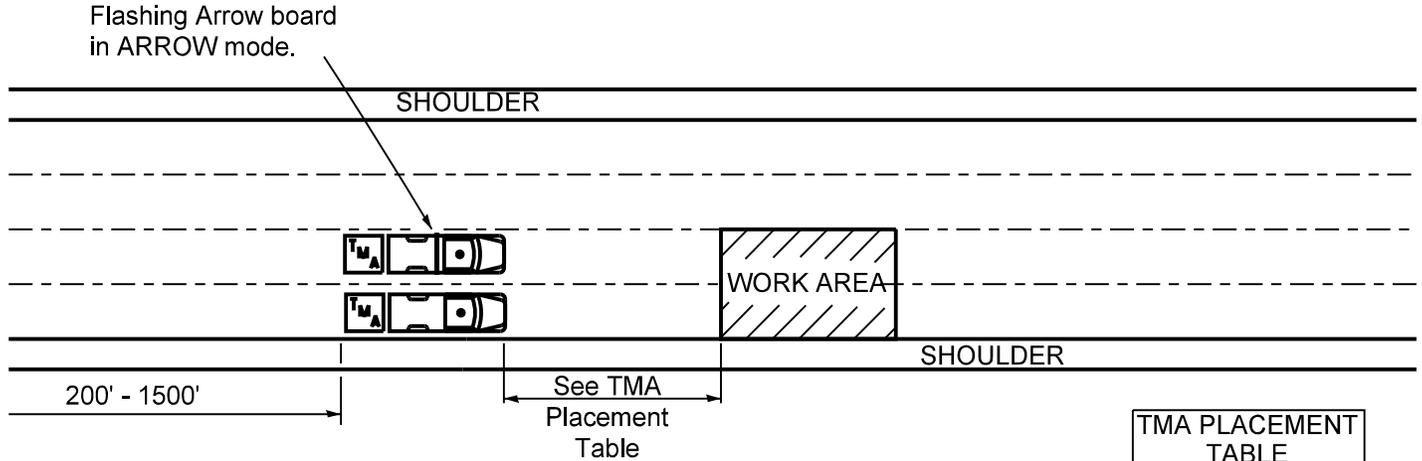


TMA PLACEMENT TABLE	
SPEED	DISTANCE
50-70	180'
≤45	120'

TABLE OF SIGN SPACING		
SPEED MPH	LENGTH	
	B	C
65-70	1600'	2600'
55-60	500'	500'
45-50	350'	350'
≤40	100'	100'

INTERMITTENT / MOVING OPERATION TWO LANE CLOSURE





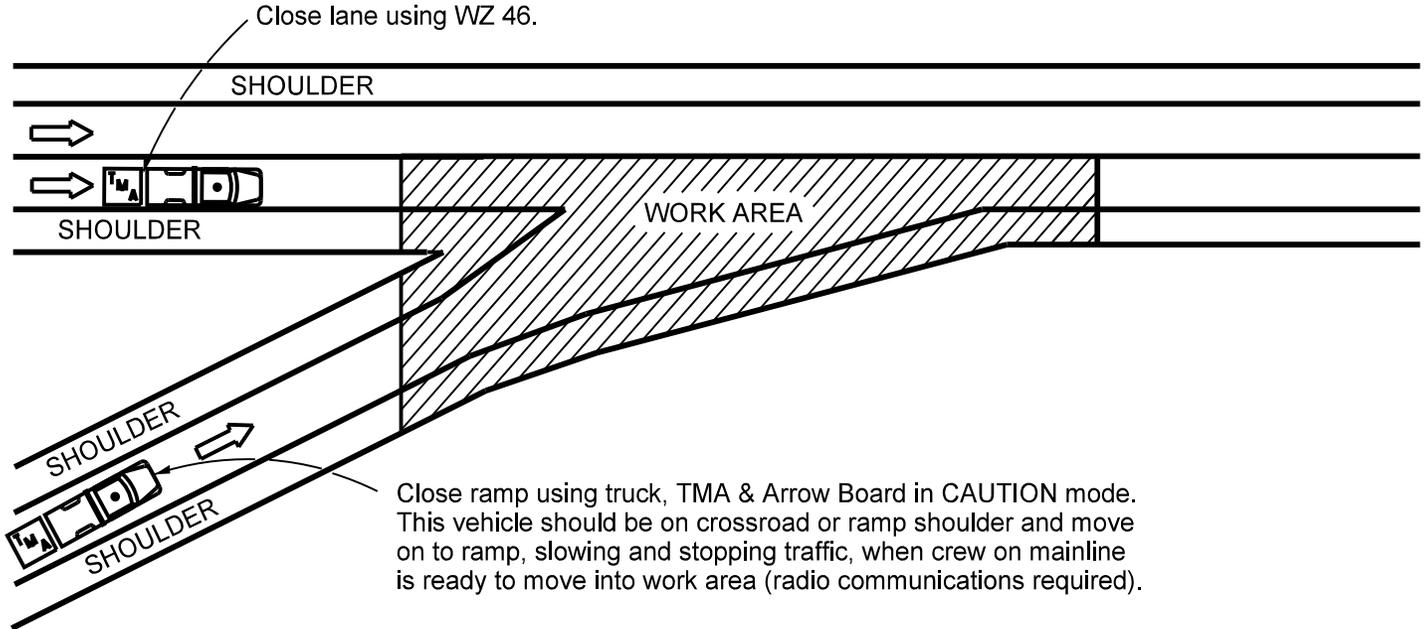
All vehicles operating strobe/warning lights.

TMA-Placed in accordance with TMA placement table.

TMA PLACEMENT TABLE	
SPEED	DISTANCE
50-70	180'
≤45	120'

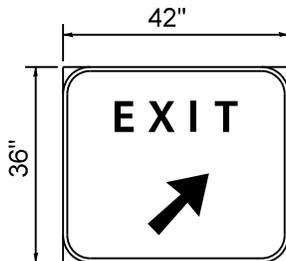
MOVING OPERATION FOR WORK AT ENTRANCE RAMP (15 MINUTES OR LESS)

WZ 63



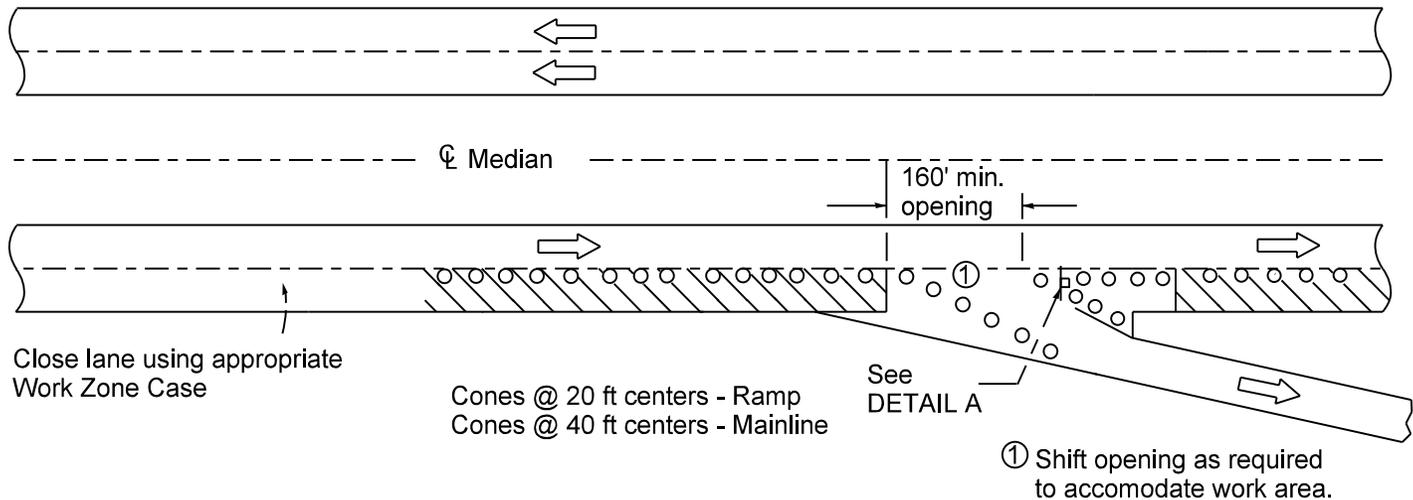
**LANE CLOSURE
OFF RAMP
NO TIME LIMIT**

WZ 64



Detail A

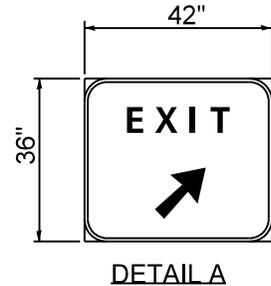
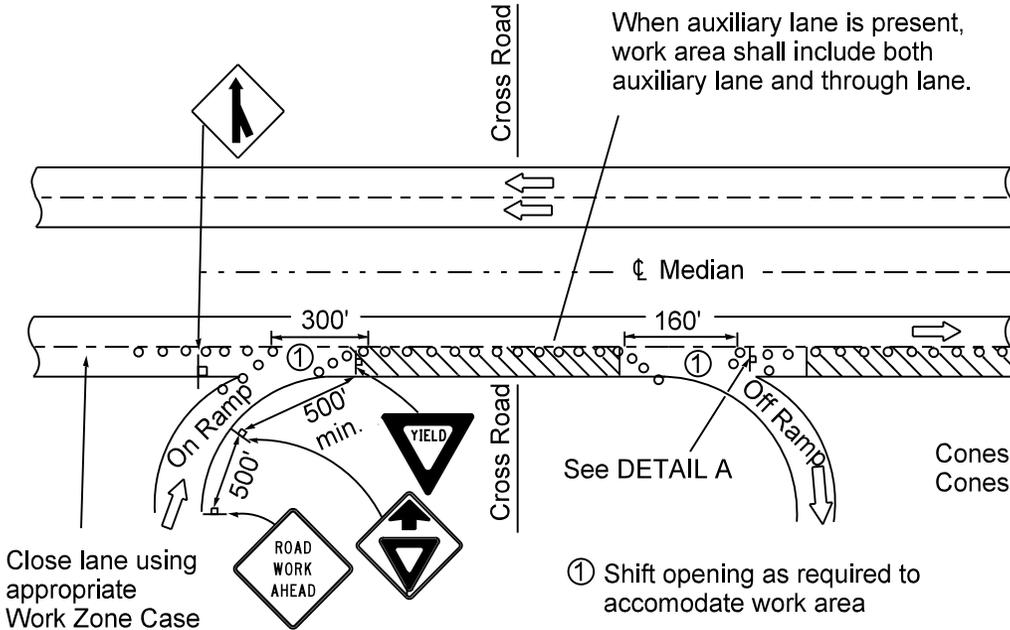
Exit sign may be omitted for operations of 15 minutes or less



**WEAVING AREA
CLOVERLEAF INTERCHANGE
NO TIME LIMIT**

WZ 66

Exit sign may be omitted for operations of 15 minutes or less

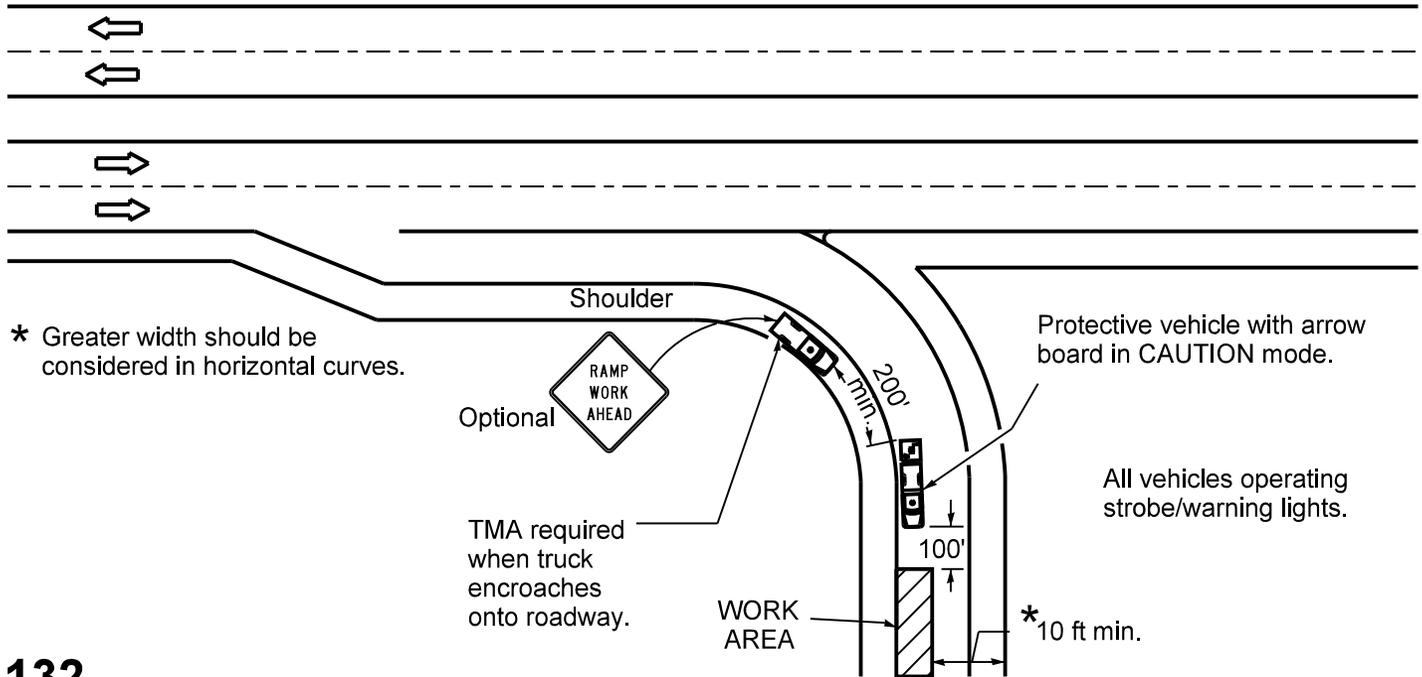


Cones @ 20 ft centers - Ramp
Cones @ 40 ft centers - Mainline

**RAMP WORK
BRIEF OR SHORT TERM
UP TO 60 MINUTES**

WZ 60

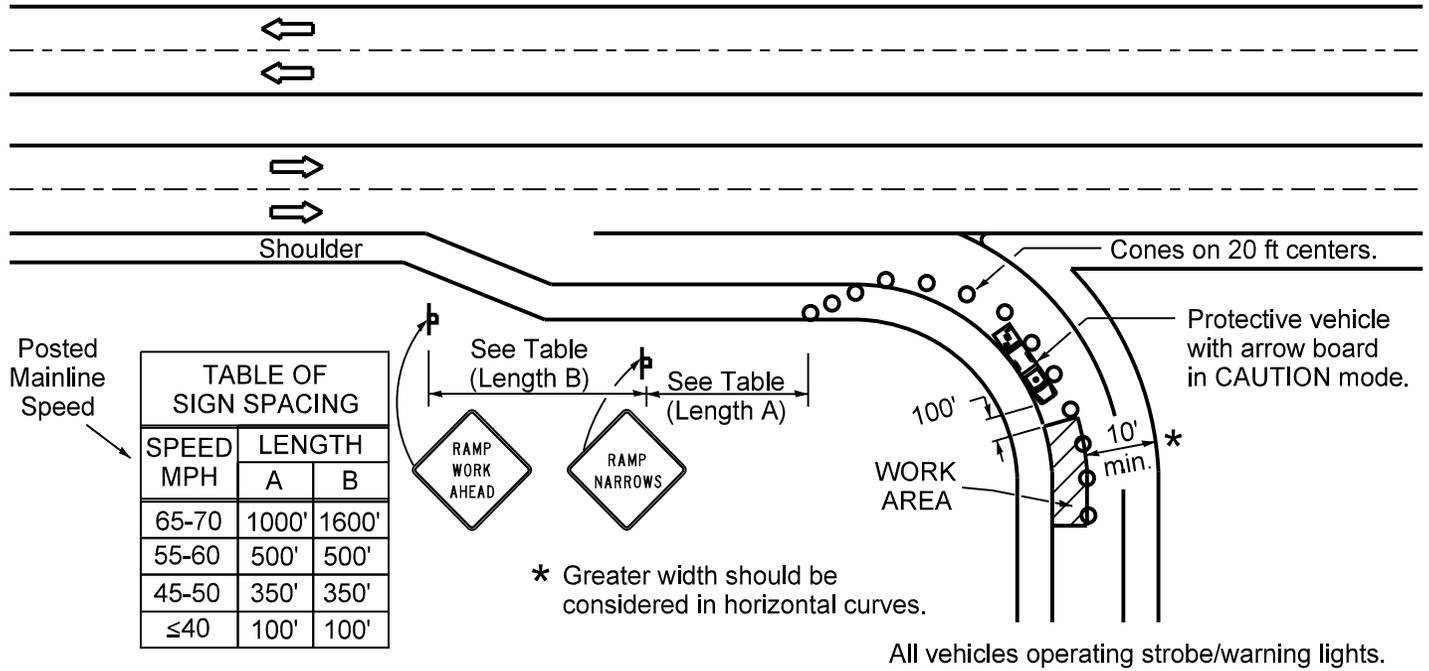
This case can be utilized for either side of ramp.



PARTIAL EXIT RAMP LANE CLOSURE NO TIME LIMIT

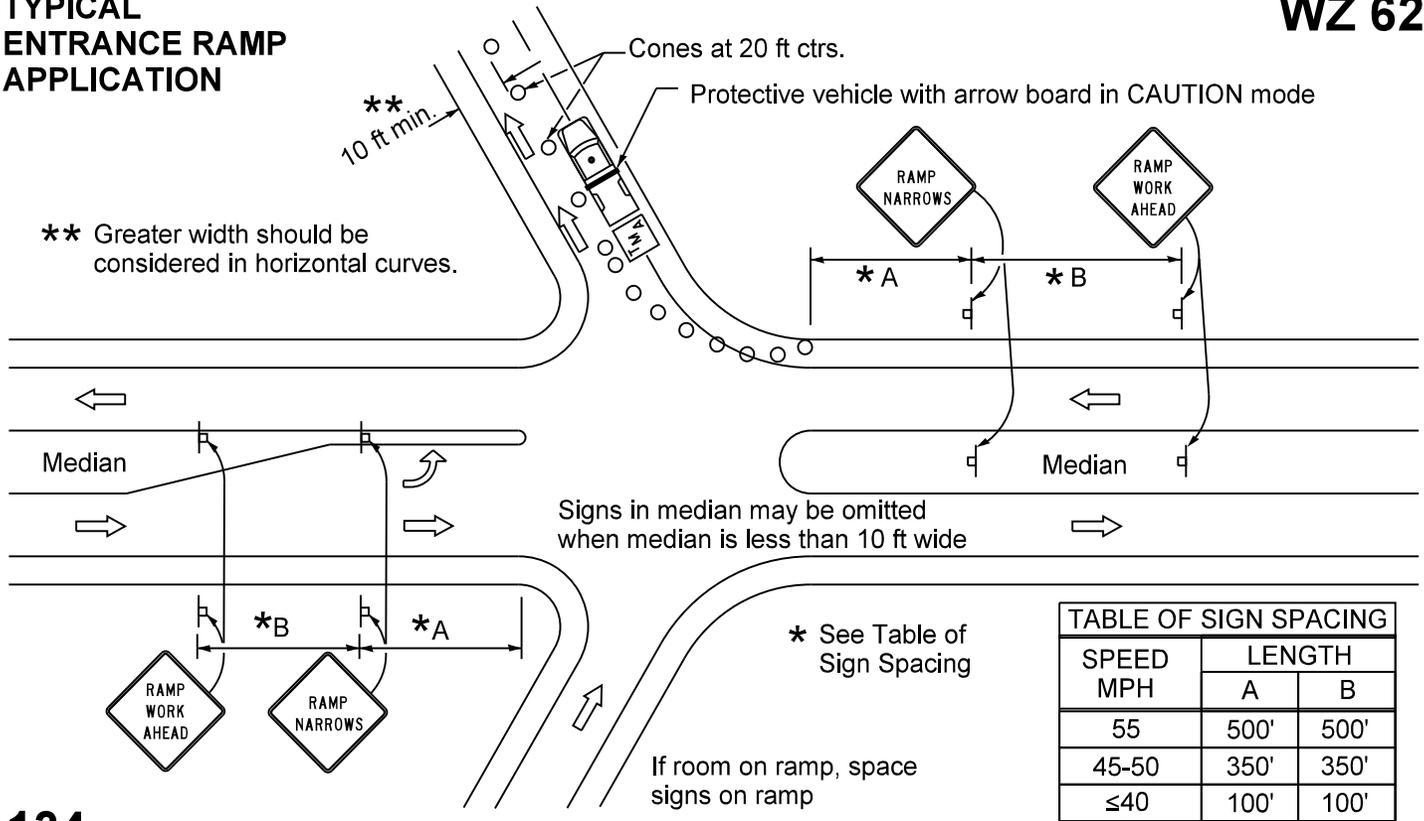
WZ 61

This case can be utilized
for either side of ramp.



TYPICAL ENTRANCE RAMP APPLICATION

WZ 62



**ALL SPEEDS
MULTILANE DIVIDED
LEFT TURN
LANE CLOSURE
NO TIME LIMIT**

****** A work zone speed limit assembly may be installed. The work zone speed limit must equal the existing regulatory speed limit.

If used, additional work zone speed limit assemblies and End Work Zone Speed Limit signs will be required in the median of divided highways if median width is 10 ft or greater.

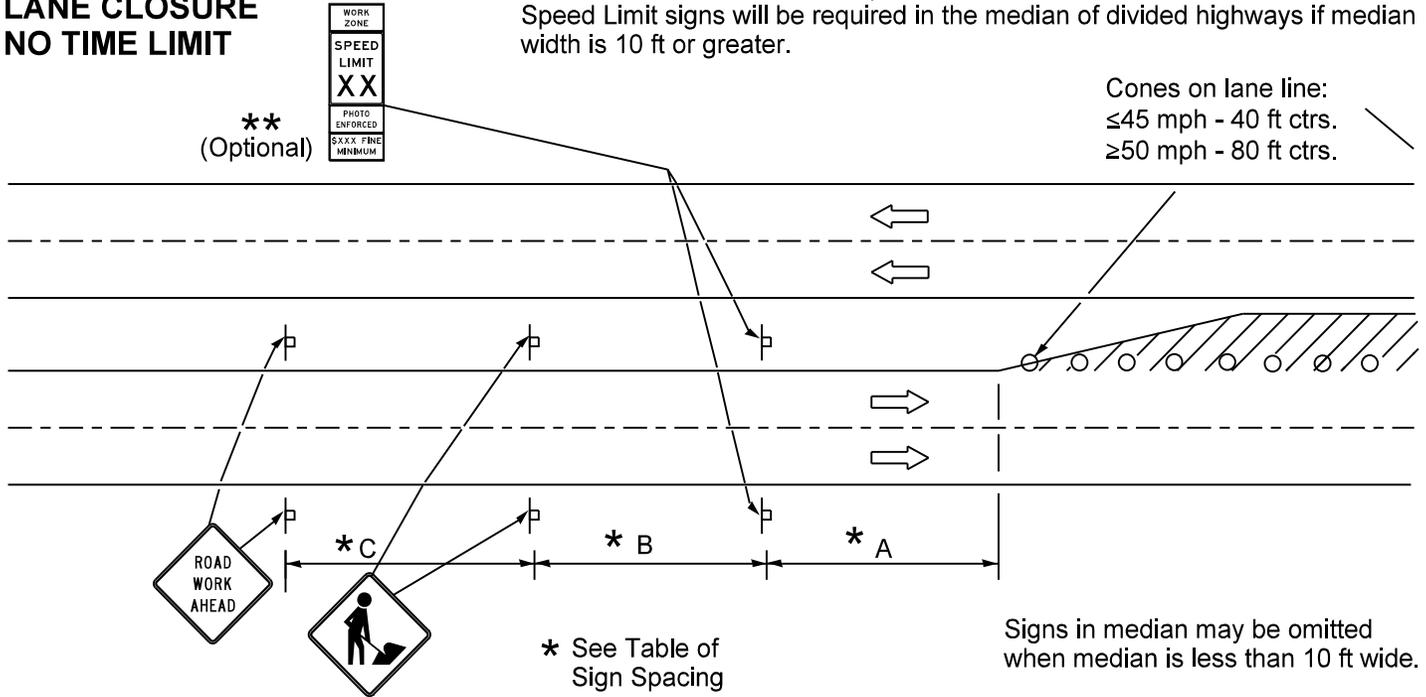
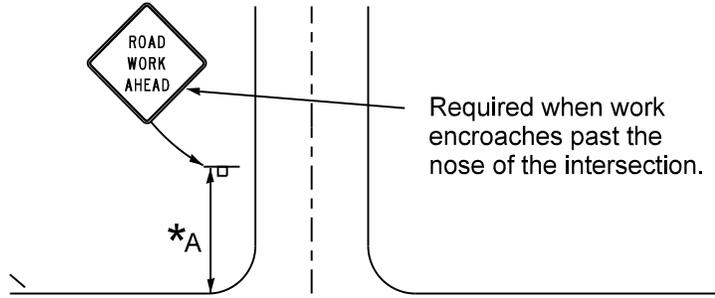
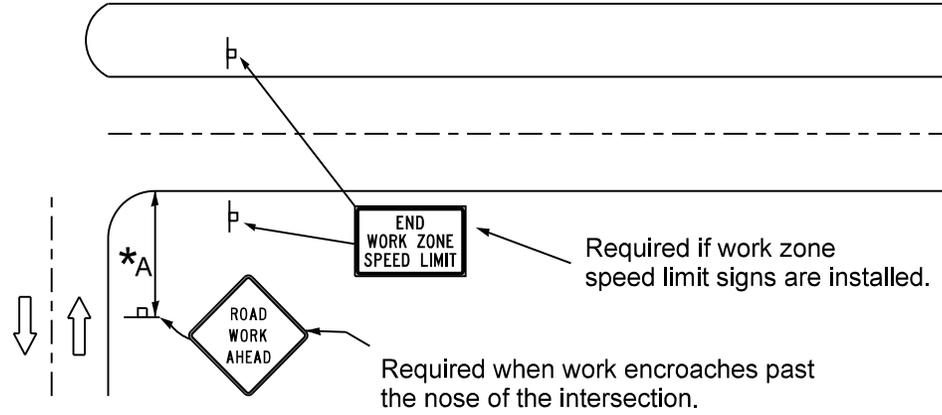


TABLE OF SIGN SPACING

SPEED MPH	LENGTH		
	A	B	C
65	1000'	1600'	2600'
55	500'	500'	500'
45-50	350'	350'	350'
≤40	100'	100'	100'



If work encroaches into side road, flagger and flagger signs are required.



J. Special Cases

1. Shoulder Work (WZ 03, WZ 04, WZ 05, WZ 06, WZ 07a, and WZ 07b)
2. Bridge Inspector-see pg 60-61 (WZ B1, WZ B2, and WZ B3)
3. Survey-see pg 54-59 (WZ S2, WZ S4, WZ S5, WZ 07a (see pg 144-145), and WZ 07b (see pg 146-147))
4. Weigh Scales (WZ W1, WZ W2, WZ W3, WZ W4, WZ W5, and WZ W6)

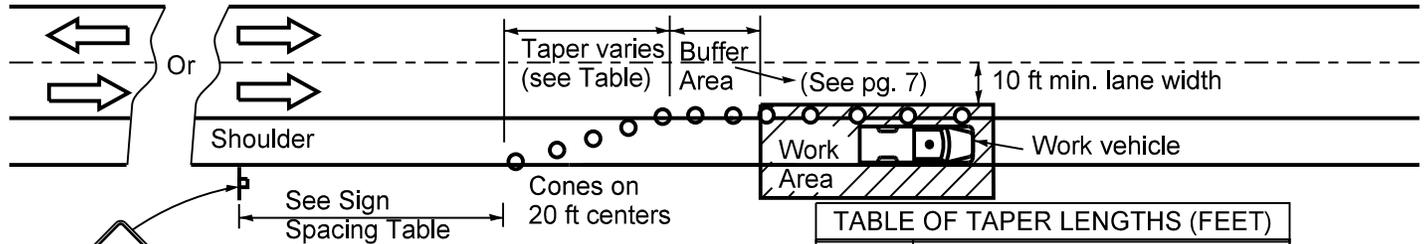
**ALL SPEEDS TWO-LANE & MULTILANE
SHOULDER WORK WITH
MINOR ENCROACHMENT
60 MINUTES OR LESS
SIGHT DISTANCE OF 1000' TO
APPROACHING TRAFFIC REQUIRED**

WZ 03

DAY AND NIGHT

THIS CASE IS ONLY ALLOWED
DURING NON-PEAK TRAFFIC.

Cones on pavement edge
≤45 mph - 40 ft ctrs.
≥50 mph - 80 ft ctrs.



When workers encroach onto roadway, a protective vehicle is required (See page 42). All vehicles shall operate strobe/warning lights.

SPEED MPH	LENGTH
65-70	1,000'
55-60	500'
45-50	350'
≤40	100'

SPEED MPH	SHOULDER WIDTH (FEET)				
	2	4	6	8	10
70	50	95	140	190	235
65	45	90	130	175	220
55	40	75	110	150	185
45	30	60	90	120	150
40	20	35	55	70	90
35	15	30	40	55	70
30	10	20	30	40	50

**ALL SPEEDS
TWO-LANE AND
MULTILANE LESS
THAN 60 MINUTES
SHOULDER WORK**

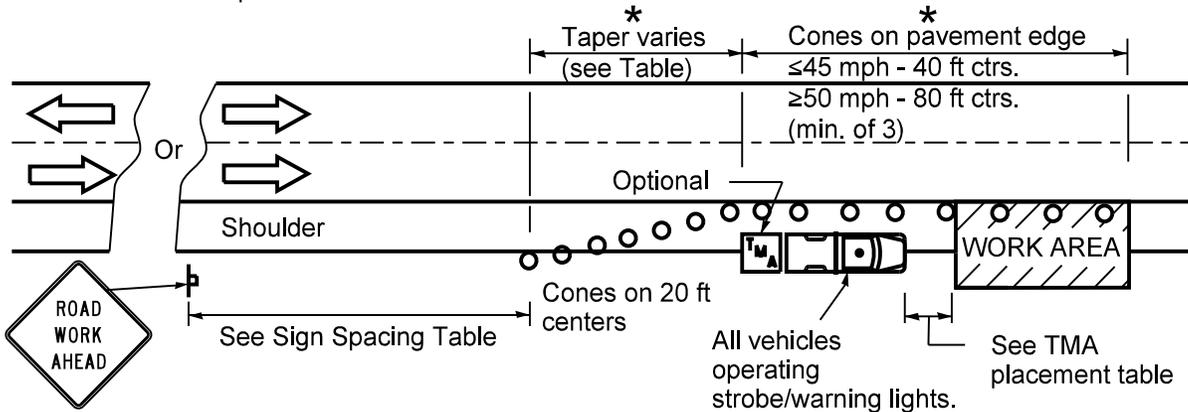
* Cones required when work is within 2 ft of pavement.

TABLE OF TAPER LENGTHS (FEET)							
SPEED MPH	SHOULDER WIDTH (FEET)						
	2	4	6	8	10	12	14
70	50	95	140	190	235	280	330
65	45	90	130	175	220	260	305
55	40	75	110	150	185	220	260
45	30	60	90	120	150	180	210
40	20	35	55	70	90	110	125
35	15	30	40	55	70	85	95
30	10	20	30	40	50	60	70

**WZ 04
DAY OR NIGHT**

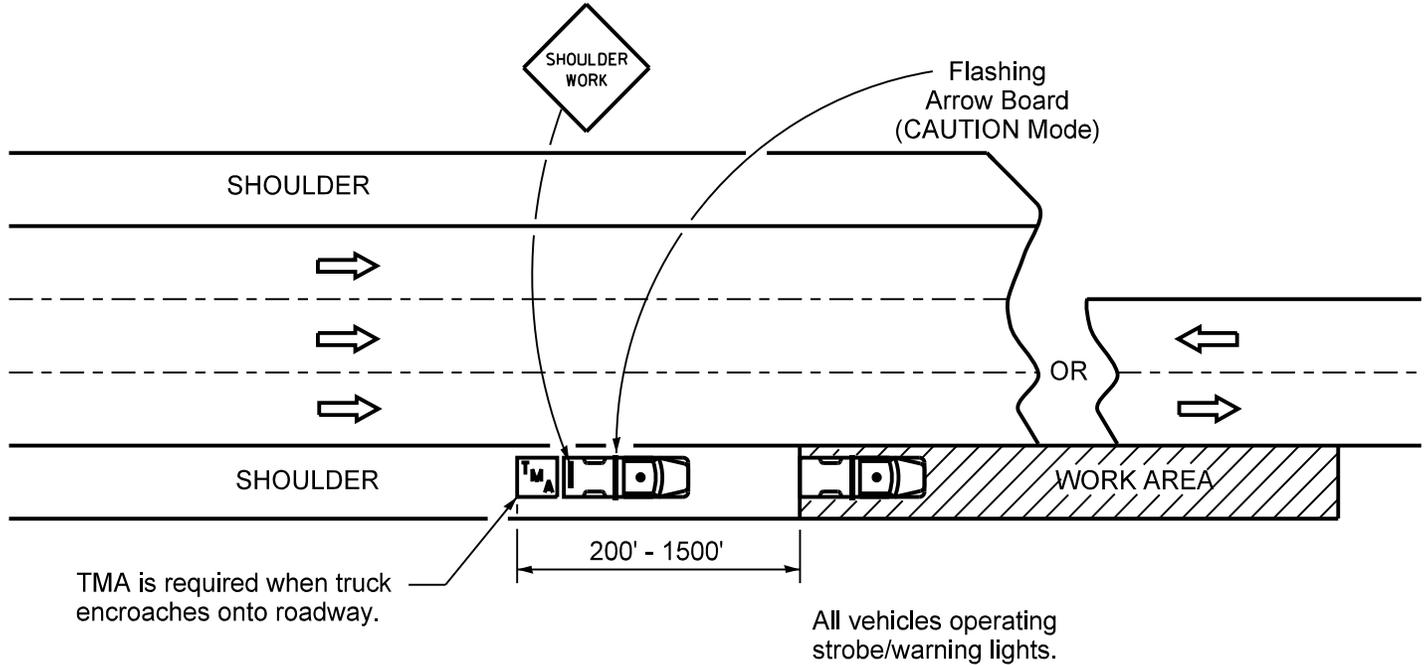
TMA PLACEMENT TABLE	
SPEED	DISTANCE
60-70	120'
50-55	100'
≤45	80'

TABLE OF SIGN SPACING	
SPEED MPH	LENGTH
65-70	1,000'
55-60	500'
45-50	350'
≤40	100'



INTERMITTENT/MOVING OPERATION SHOULDER WORK

WZ 05

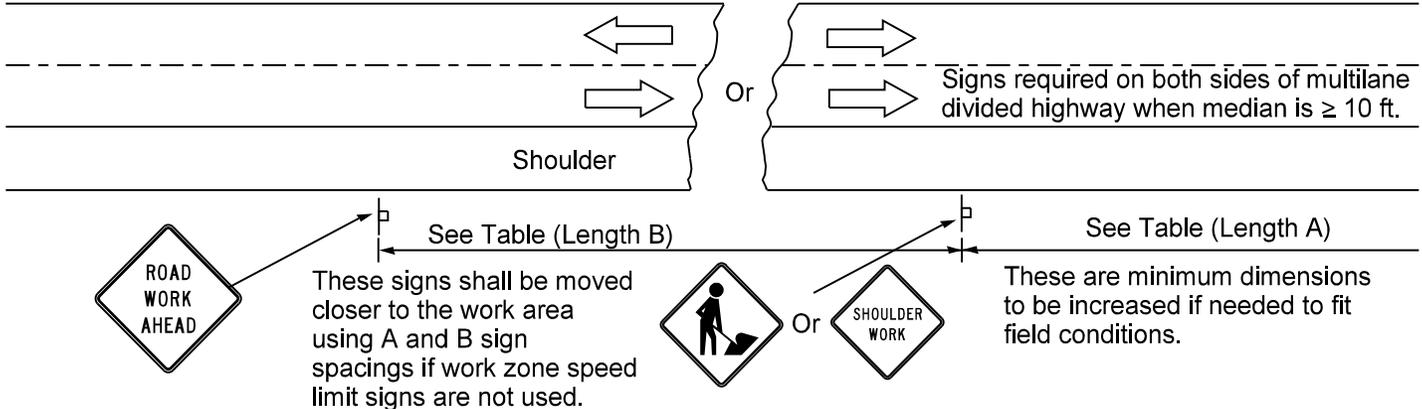


**ALL SPEEDS
TWO-LANE AND
MULTILANE 60
MINUTES OR MORE
SHOULDER WORK**

TABLE OF TAPER LENGTHS (FEET)							
SPEED MPH	SHOULDER WIDTH (FEET)						
	2	4	6	8	10	12	14
70	50	95	140	190	235	280	330
65	45	90	130	175	220	260	305
55	40	75	110	150	185	220	260
45	30	60	90	120	150	180	210
40	20	35	55	70	90	110	125
35	15	30	40	55	70	85	95
30	10	20	30	40	50	60	70

For work more than 2 hours an arrow board in CAUTION mode is required.

If work area is > 15 ft from pavement edge, no signs are required.



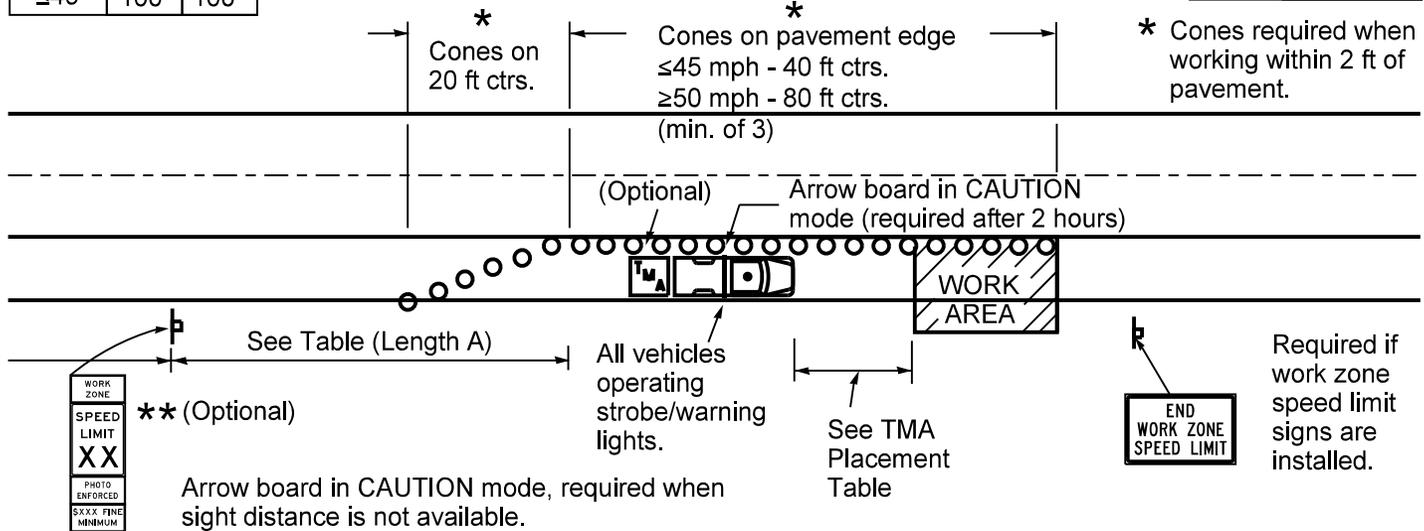
WZ 06

TABLE OF SIGN SPACING		
SPEED MPH	LENGTH	
	A	B
65-70	1000'	1600'
55-60	500'	500'
45-50	350'	350'
≤40	100'	100'

****** A work zone speed limit assembly may be installed. The work zone speed limit must equal the existing regulatory speed limit.

If used, additional work zone speed limit assemblies and End Work Zone Speed Limit signs will be required in the median of divided highways if median width is 10 ft or greater.

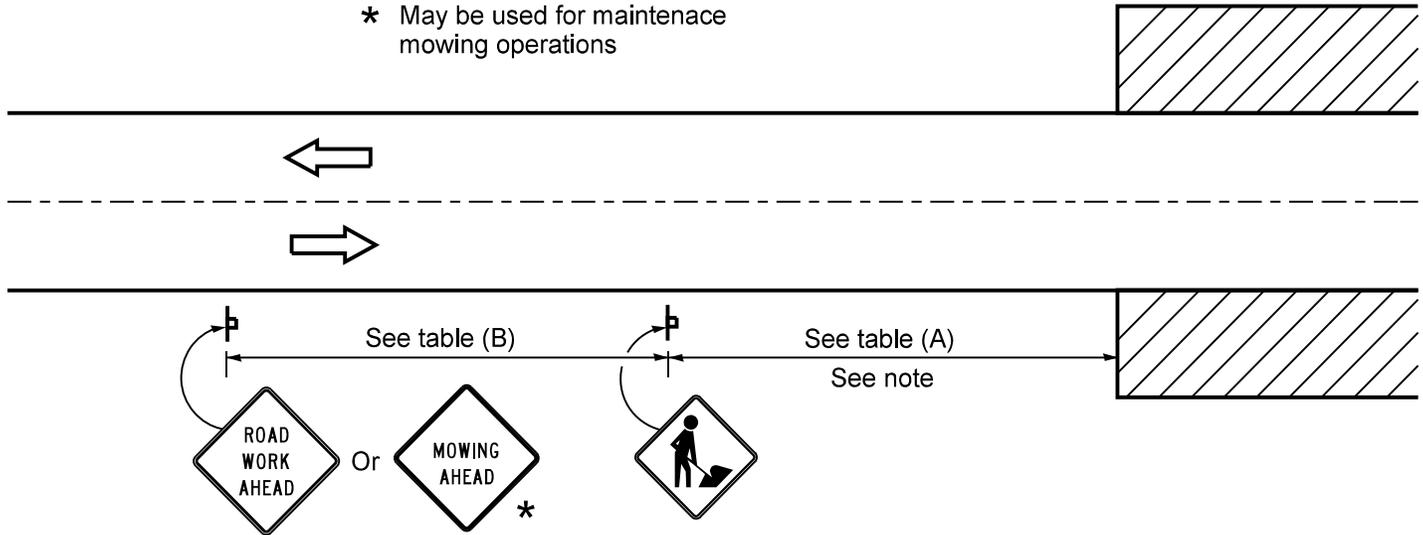
TMA PLACEMENT TABLE	
SPEED	DISTANCE
60-70	120'
50-55	100'
≤45	80'



Required if work zone speed limit signs are installed.

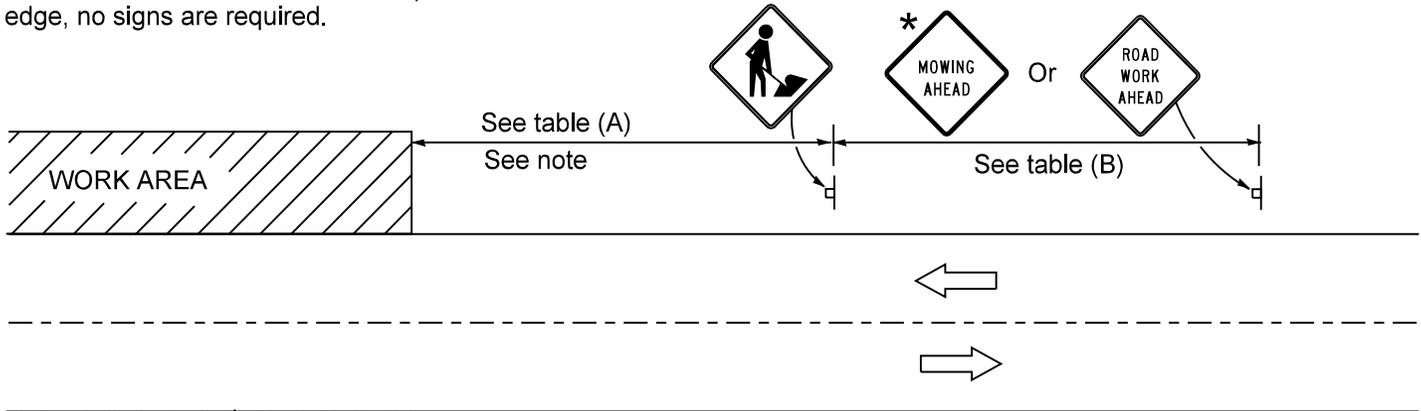
**ALL SPEEDS
TWO LANE, TWO WAY
OFF ROAD MOVING OPERATION
NO TIME LIMIT**

* May be used for maintenance
mowing operations



WZ 07a

If work area is more than 15 ft from pavement edge, no signs are required.

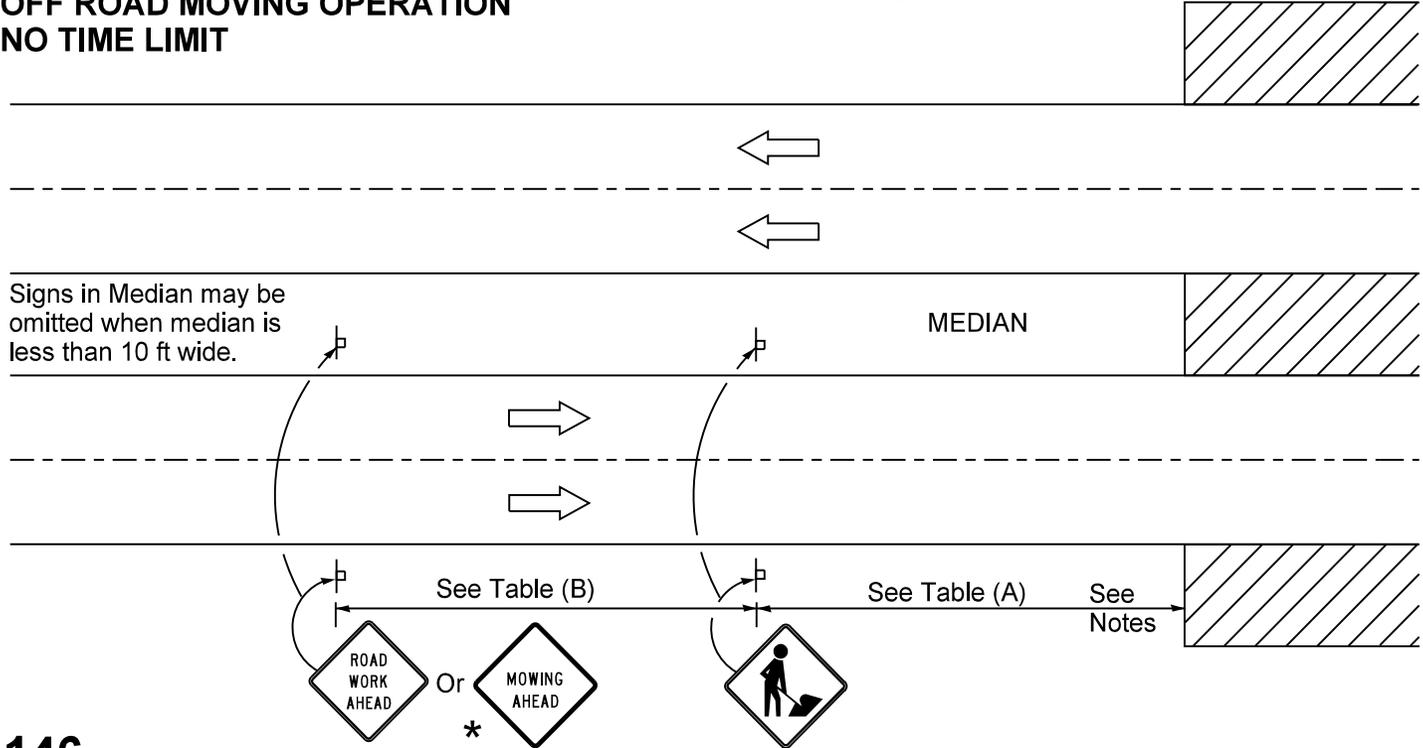


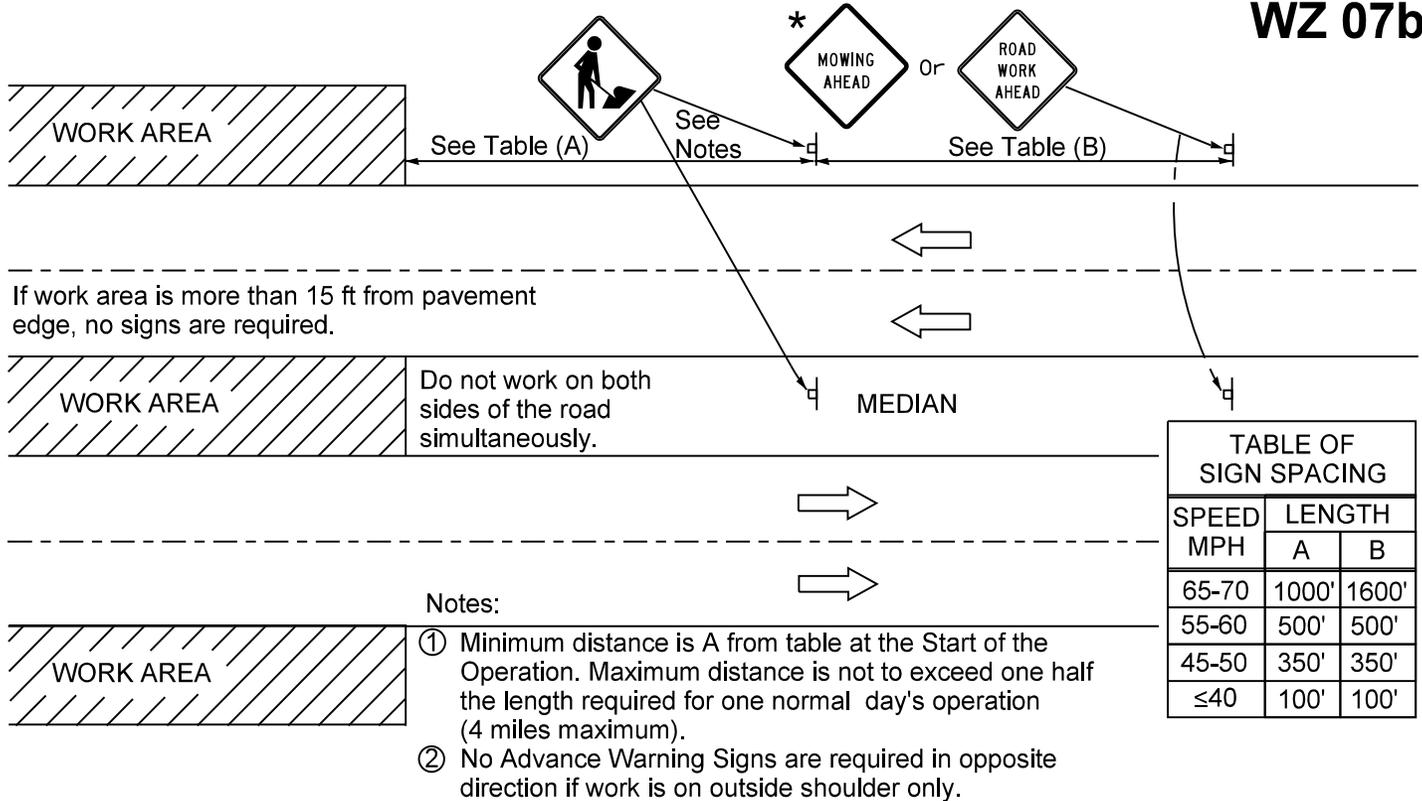
Note:
Minimum distance is A from table at the Start of the Operation. Maximum distance is not to exceed one half the length required for one normal day's operation (4 miles maximum).

TABLE OF SIGN SPACING		
SPEED MPH	LENGTH	
	A	B
55	500'	500'
45-50	350'	350'
≤40	100'	100'

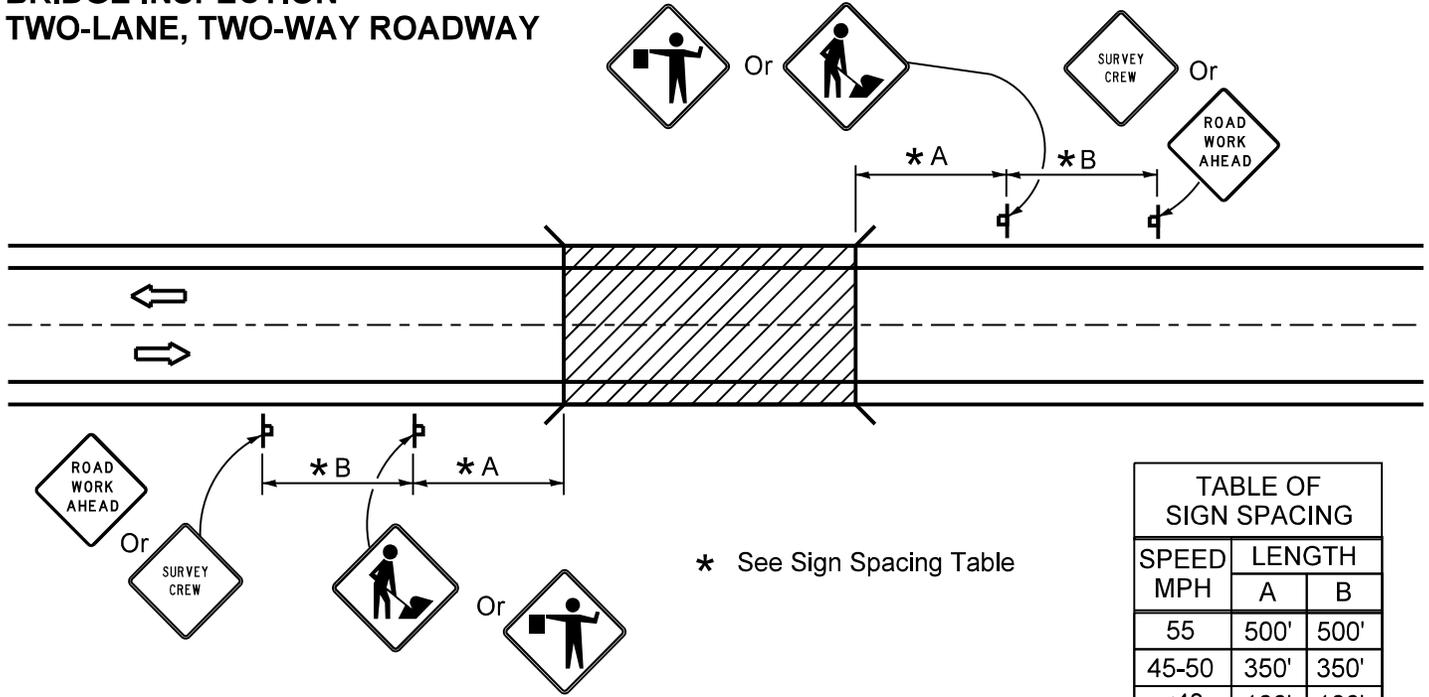
**ALL SPEEDS
MULTILANE
OFF ROAD MOVING OPERATION
NO TIME LIMIT**

* May be used for maintenance mowing operations





BRIDGE INSPECTION TWO-LANE, TWO-WAY ROADWAY



* See Sign Spacing Table

SPEED MPH	LENGTH	
	A	B
55	500'	500'
45-50	350'	350'
≤40	100'	100'

Notes:

May be performed without a flagger, provided:

1. Each task must be performed with extreme care.
2. The amount of time the workers are on the pavement shall be minimized.
3. Workers shall enter onto the pavement only during appropriate gaps in traffic.
4. Adequate sight distance must be available to utilize this case.
5. Vehicle may not encroach onto the pavement.
6. Vehicle shall have its strobe/warning lights on.

No attempts shall be made to stop, slow, or direct traffic into another lane except by a properly equipped flagger with proper warning signs in place.

When it is necessary for the vehicle to stop on the roadway, traffic control shall be in accordance with the proper case.

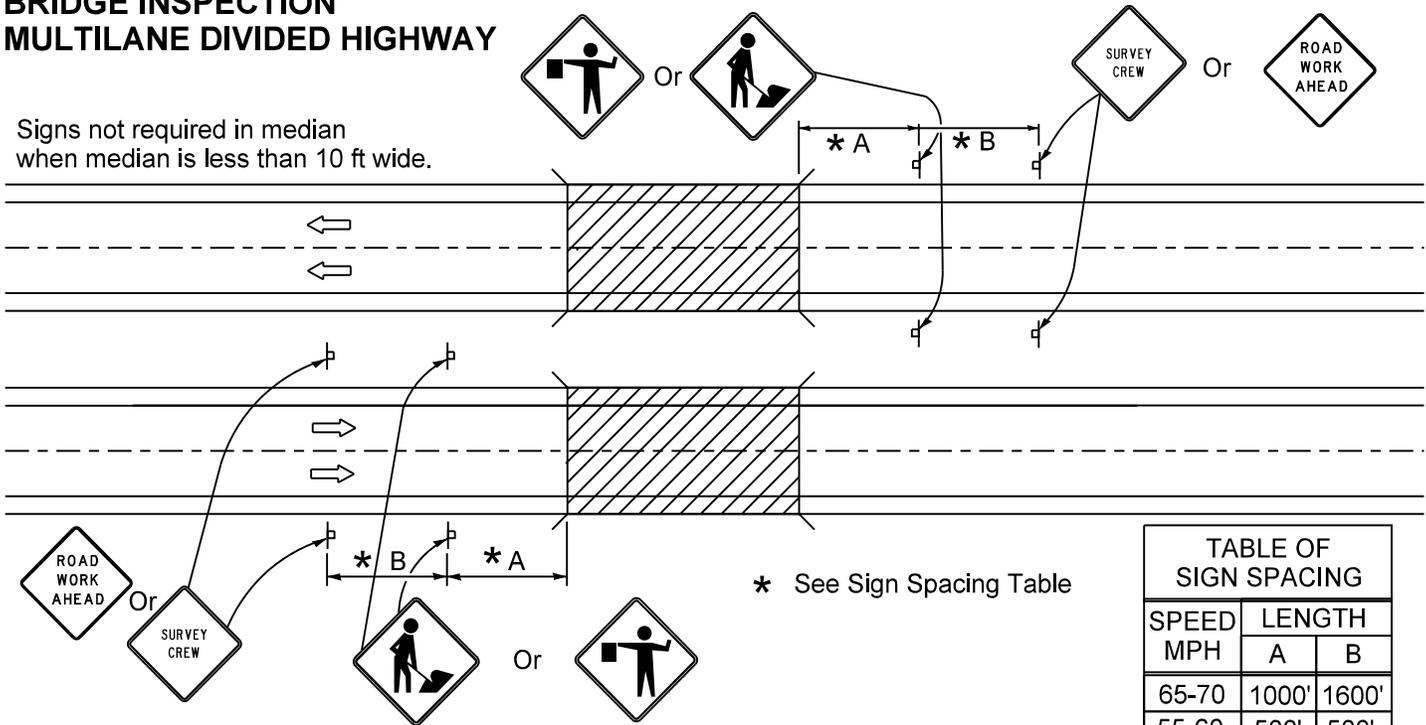
Workers, vehicles, and equipment should remain on one side of the road.

Full lane closure should be considered when work at one location would exceed one hour.

If workers must remain in traffic lane and appropriate gaps do not exist, the lane must be closed with proper traffic control signs and devices.

BRIDGE INSPECTION MULTILANE DIVIDED HIGHWAY

Signs not required in median
when median is less than 10 ft wide.



Notes:

May be performed without a flagger, provided:

1. Each task must be performed with extreme care.
2. The amount of time the workers are on the pavement shall be minimized.
3. Workers shall enter onto the pavement only during appropriate gaps in traffic.
4. Adequate sight distance must be available to utilize this case.
5. Vehicle may not encroach onto the pavement.
6. Vehicle shall have its strobe/warning lights on.

No attempts shall be made to stop, slow, or direct traffic into another lane except by a properly equipped flagger with proper warning signs in place.

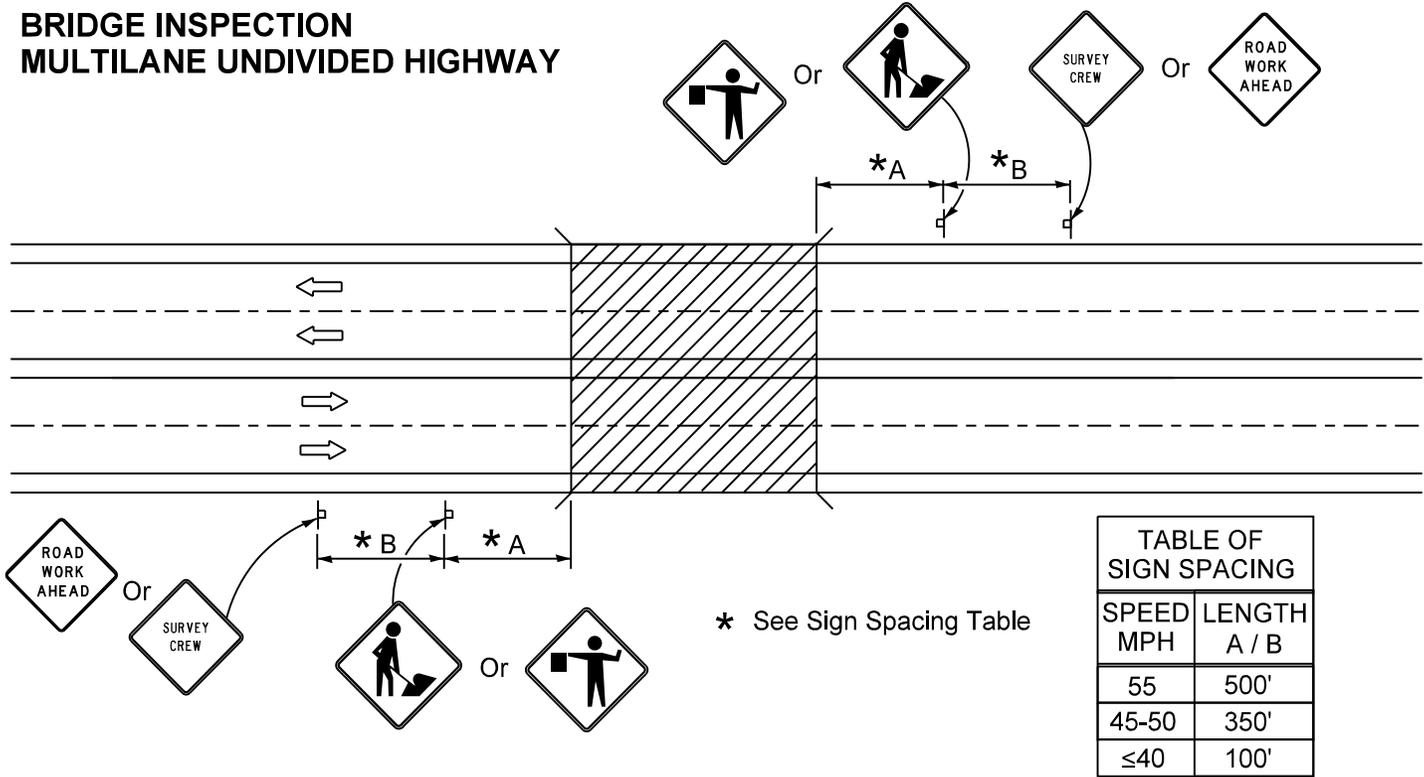
When it is necessary for the vehicle to stop on the roadway, traffic control shall be in accordance with the proper case.

Workers, vehicles, and equipment should remain on one side of the road.

Full lane closure should be considered when work at one location would exceed one hour.

If workers must remain in traffic lane and appropriate gaps do not exist, the lane must be closed with proper traffic control signs and devices.

BRIDGE INSPECTION MULTILANE UNDIVIDED HIGHWAY



Notes:

May be performed without a flagger, provided:

1. Each task must be performed with extreme care.
2. The amount of time the workers are on the pavement shall be minimized.
3. Workers shall enter onto the pavement only during appropriate gaps in traffic.
4. Adequate sight distance must be available to utilize this case.
5. Vehicle may not encroach onto the pavement.
6. Vehicle shall have its strobe/warning lights on.

No attempts shall be made to stop, slow, or direct traffic into another lane except by a properly equipped flagger with proper warning signs in place.

When it is necessary for the vehicle to stop on the roadway, traffic control shall be in accordance with the proper case.

Workers, vehicles, and equipment should remain on one side of the road.

Full lane closure should be considered when work at one location would exceed one hour.

If workers must remain in traffic lane and appropriate gaps do not exist, the lane must be closed with proper traffic control signs and devices.

SURVEY WORK SHORT-TERM INTERMITTENT MOVING OPERATION ON PAVEMENT TWO-LANE, TWO-WAY

Flagging shall be in accordance with the Flaggers' Guide.

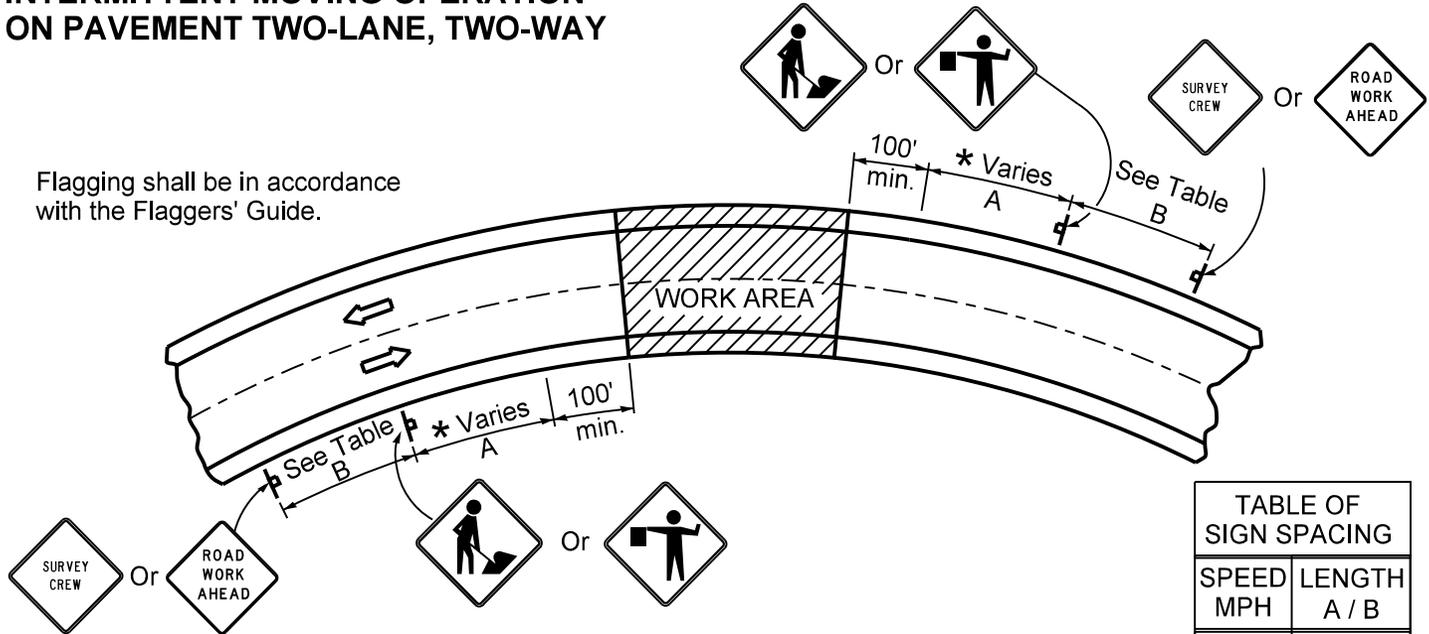


TABLE OF SIGN SPACING	
SPEED MPH	LENGTH A / B
55	500'
45-50	350'
≤40	100'

* Minimum distance is A.
Max. distance in no case to exceed one half the length required for one normal day's operation, or 2 miles whichever is less.

Notes:

May be performed without a flagger, provided:

1. Each task must be performed with extreme care.
2. The amount of time the workers are on the pavement shall be minimized.
3. Workers shall enter onto the pavement only during appropriate gaps in traffic.
4. Adequate sight distance must be available to utilize this case.
5. Vehicle may not encroach onto the pavement.
6. Vehicle shall have its strobe/warning lights on.

No attempts shall be made to stop, slow, or direct traffic into another lane except by a properly equipped flagger with proper warning signs in place.

When it is necessary for the vehicle to stop on the roadway, traffic control shall be in accordance with the proper case.

This case is allowed during non-peak traffic.

Workers, vehicles, and equipment should remain on one side of the road.

Full lane closure should be considered when work at one location would exceed one hour.

If workers must remain in traffic lane and appropriate gaps do not exist, the lane must be closed with proper traffic control signs and devices.

SURVEY WORK SHORT-TERM MOVING OPERATION ON PAVEMENT MULTILANE ROADWAY

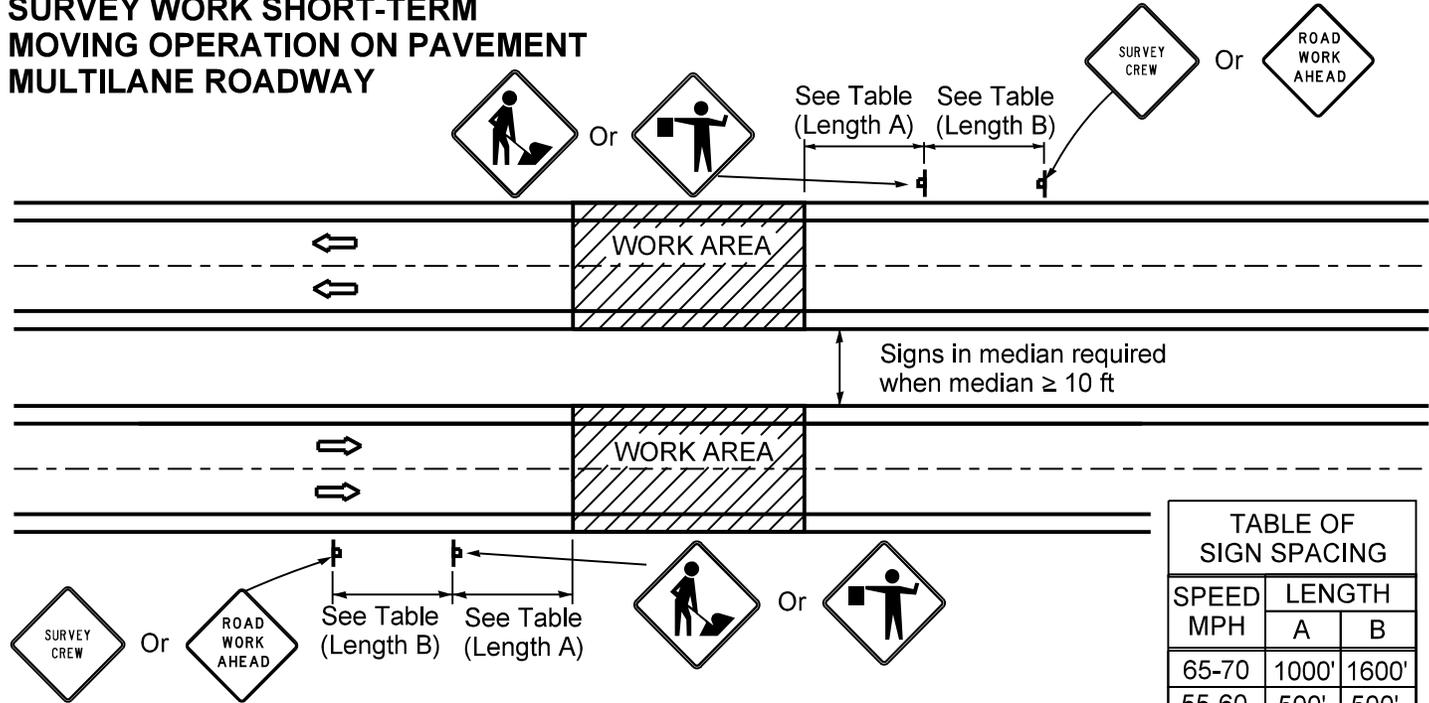


TABLE OF SIGN SPACING

SPEED MPH	LENGTH	
	A	B
65-70	1000'	1600'
55-60	500'	500'
45-50	350'	350'
≤40	100'	100'

Minimum distance is A,
Max. distance is 1/2 length required for normal days operation, or 2 miles whichever is less.

Notes:

May be performed without a flagger, provided:

1. Each task must be performed with extreme care.
2. The amount of time the workers are on the pavement shall be minimized.
3. Workers shall enter onto the pavement only during appropriate gaps in traffic.
4. Adequate sight distance must be available to utilize this case.
5. Vehicle may not encroach onto the pavement.
6. Vehicle shall have its strobe/warning lights on.

No attempts shall be made to stop, slow, or direct traffic into another lane except by a properly equipped flagger with proper warning signs in place.

When it is necessary for the vehicle to stop on the roadway, traffic control shall be in accordance with the proper case.

This case is allowed during non-peak traffic.

Workers, vehicles, and equipment should remain on one side of the road.

Full lane closure should be considered when work at one location would exceed one hour.

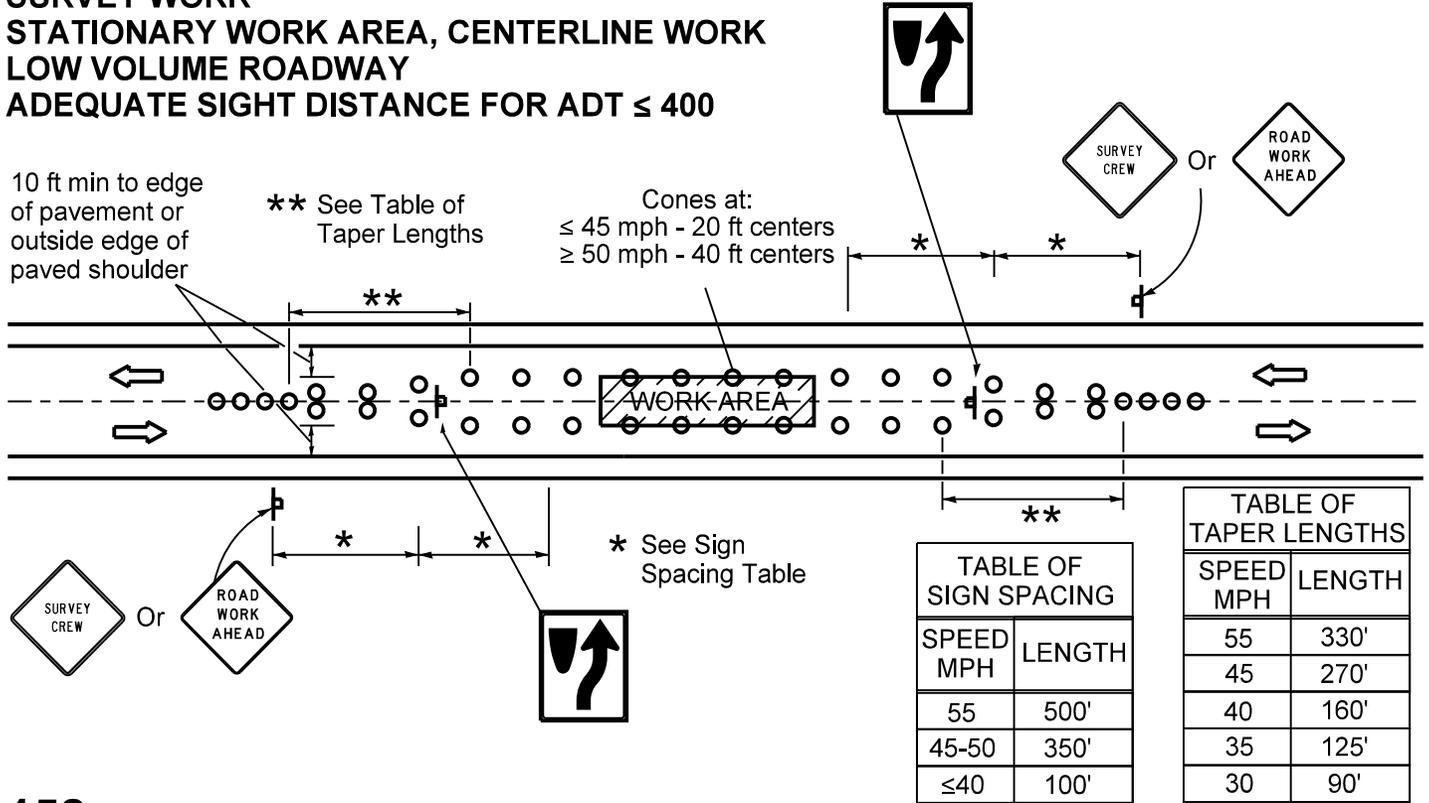
If workers must remain in traffic lane and appropriate gaps do not exist, the lane must be closed with proper traffic control signs and devices.

**SURVEY WORK
STATIONARY WORK AREA, CENTERLINE WORK
LOW VOLUME ROADWAY
ADEQUATE SIGHT DISTANCE FOR ADT ≤ 400**

10 ft min to edge of pavement or outside edge of paved shoulder

** See Table of Taper Lengths

Cones at:
≤ 45 mph - 20 ft centers
≥ 50 mph - 40 ft centers



* See Sign Spacing Table

SPEED MPH	LENGTH
55	500'
45-50	350'
≤40	100'

SPEED MPH	LENGTH
55	330'
45	270'
40	160'
35	125'
30	90'

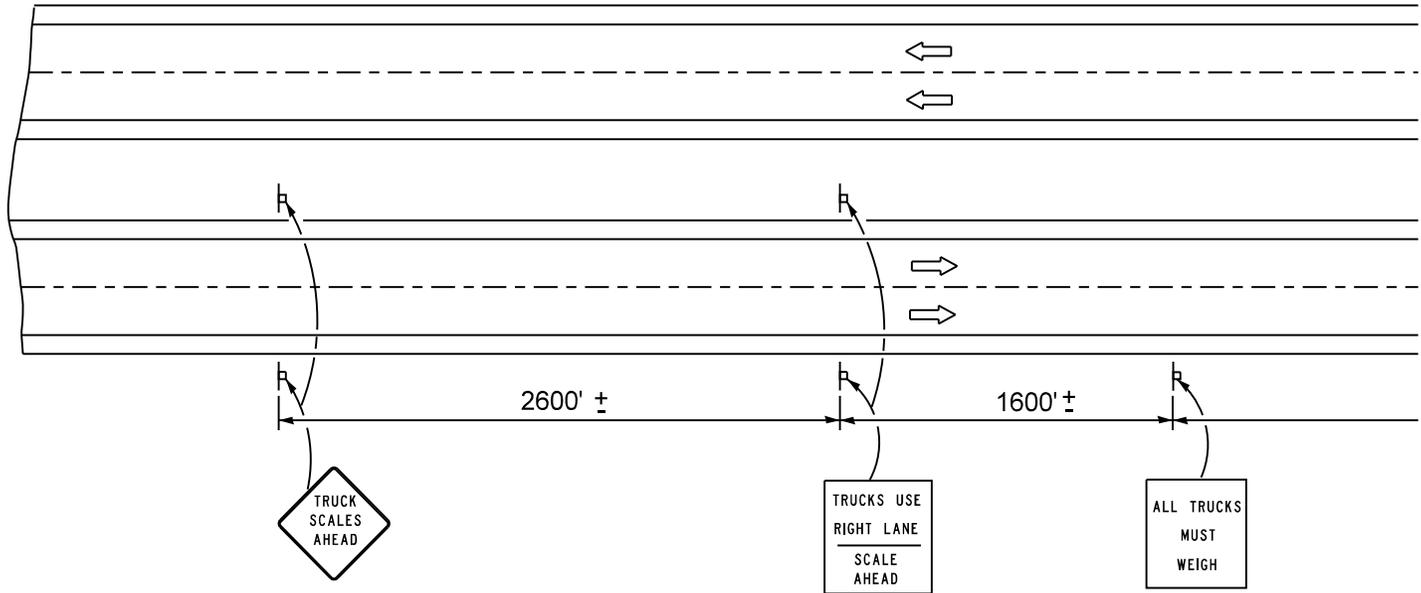
Notes:

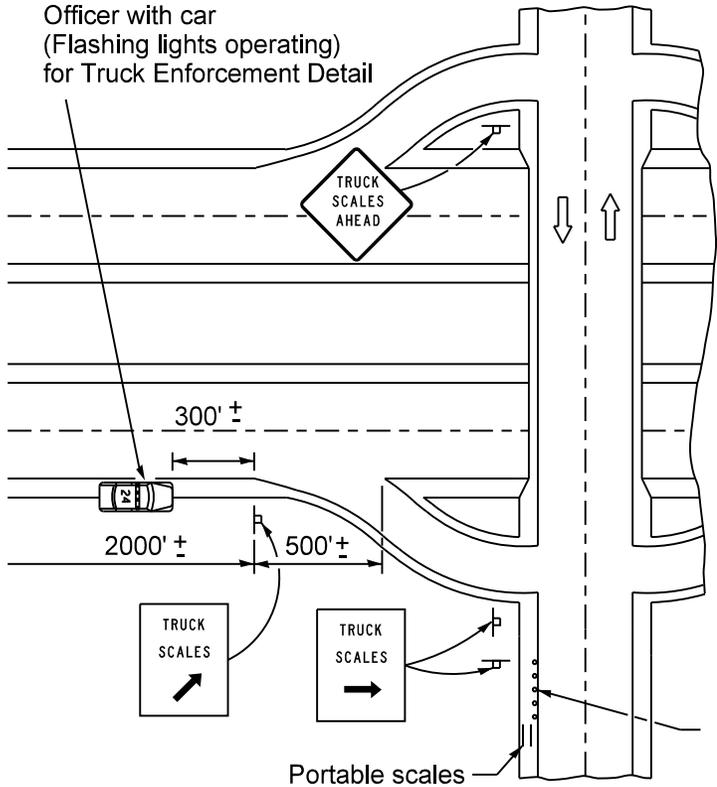
Each task must be performed with extreme care

Workers shall cross the pavement only during appropriate gaps in traffic.

No attempts shall be made to stop, slow, or direct traffic into another lane except by properly equipped flagger with proper warning signs in place.

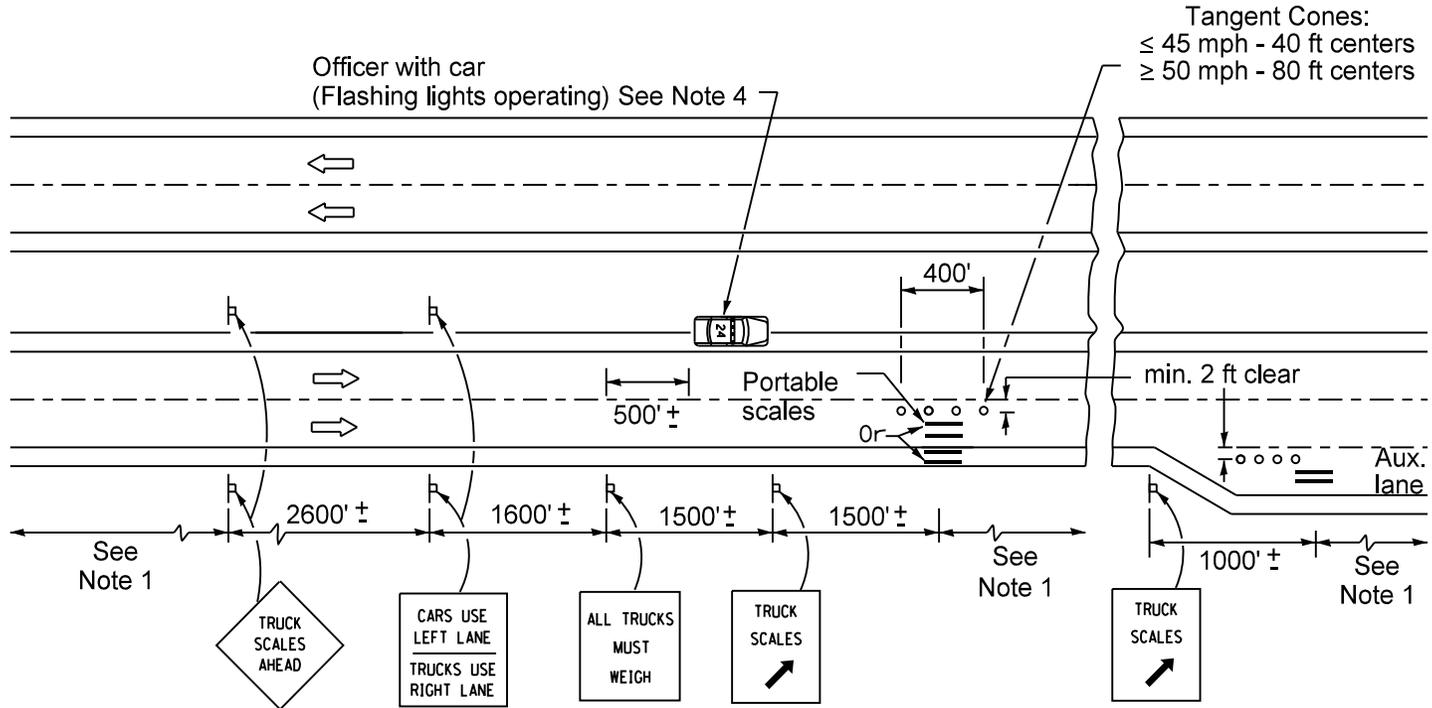
**STATE POLICE / IDOT TRUCK WEIGH SCALES OR
OFFICE OF QUALITY COMPLIANCE AND REVIEW CREW
MULTILANE ROADWAY AT INTERCHANGE**





Scales and cones shall be at least 2 ft from edge of roadway. If the posted speed or operating speeds at the location exceed 40 mph, scales shall be at least 4 ft from edge of roadway.

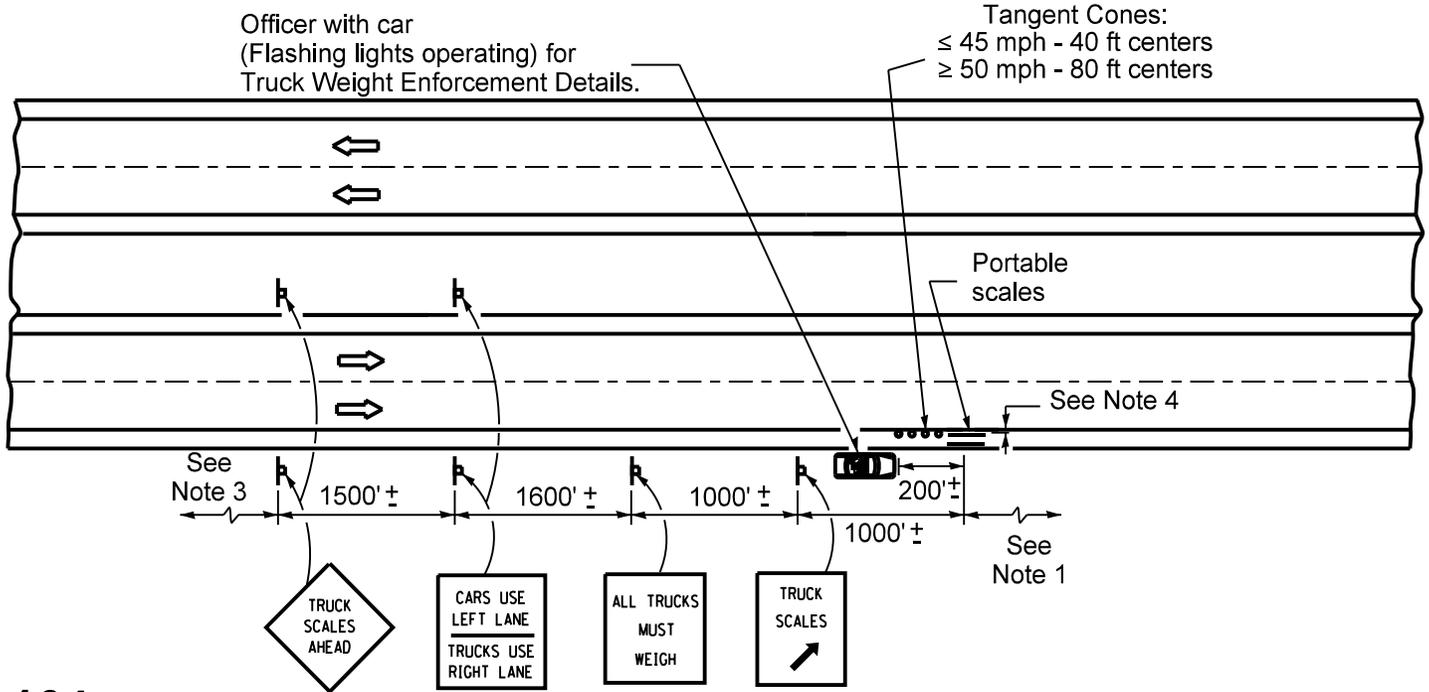
**STATE POLICE / IDOT TRUCK
WEIGH SCALES - ONLY
MULTILANE ROADWAY ON / ALONG ROADWAY**



Notes:

1. For full access control; signing should be at least 5000 ft beyond preceeding interchange entrance ramp and scales should be at least 2000 ft in advance of the exit gore for the next interchange. On other highways, scales should be located away from major intersections, when practical.
2. For all other highways, intersections within the advance warning area shall be signed with "Road Work Ahead" 200 ft in advance of the intersection.
3. Weighing on Interstate Routes is allowed only at approved locations.
4. Police car may be located off the edge of the right shoulder when there is insufficient space to park on left.
5. On highways with < 10 ft median eliminate signs on left. Lane closure not allowed on non-divided highways having posted speed greater than 45 mph.

**STATE POLICE / IDOT TRUCK WEIGH SCALES OR
OFFICE OF QUALITY COMPLIANCE AND REVIEW CREW
MULTILANE ROADWAY NON-INTERSTATE**

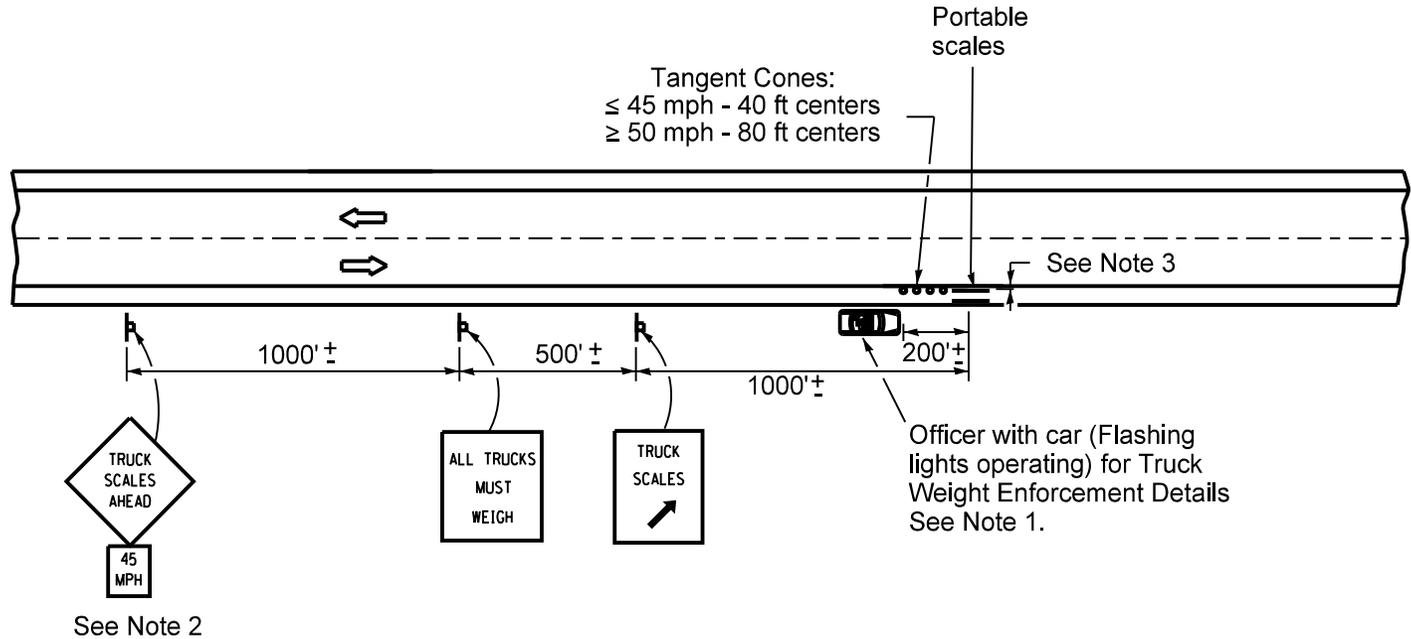


Notes:

WZ W3

1. For full access control; signing should be at least 5000 ft beyond preceding interchange entrance ramp and scales should be at least 2000 ft in advance of the exit gore for the next interchange. On other highways, scales should be located away from major intersections, when practical.
2. For all other highways, intersections within the advance warning area shall be signed with "Road Work Ahead" 200 ft in advance of the intersection.
3. On highways with less than 10 ft median eliminate signs on left. Lane closure not allowed on non-divided highways having posted speed greater than 45 mph.
4. Scales and cones shall be at least 2 ft from edge of roadway. If the posted speed or operating speeds at the location exceed 40 mph, scales shall be at least 4 ft from edge of roadway.

**STATE POLICE / IDOT TRUCK WEIGH SCALES OR
OFFICE OF QUALITY COMPLIANCE AND REVIEW CREW
2-LANE, 2-WAY ROADWAY**

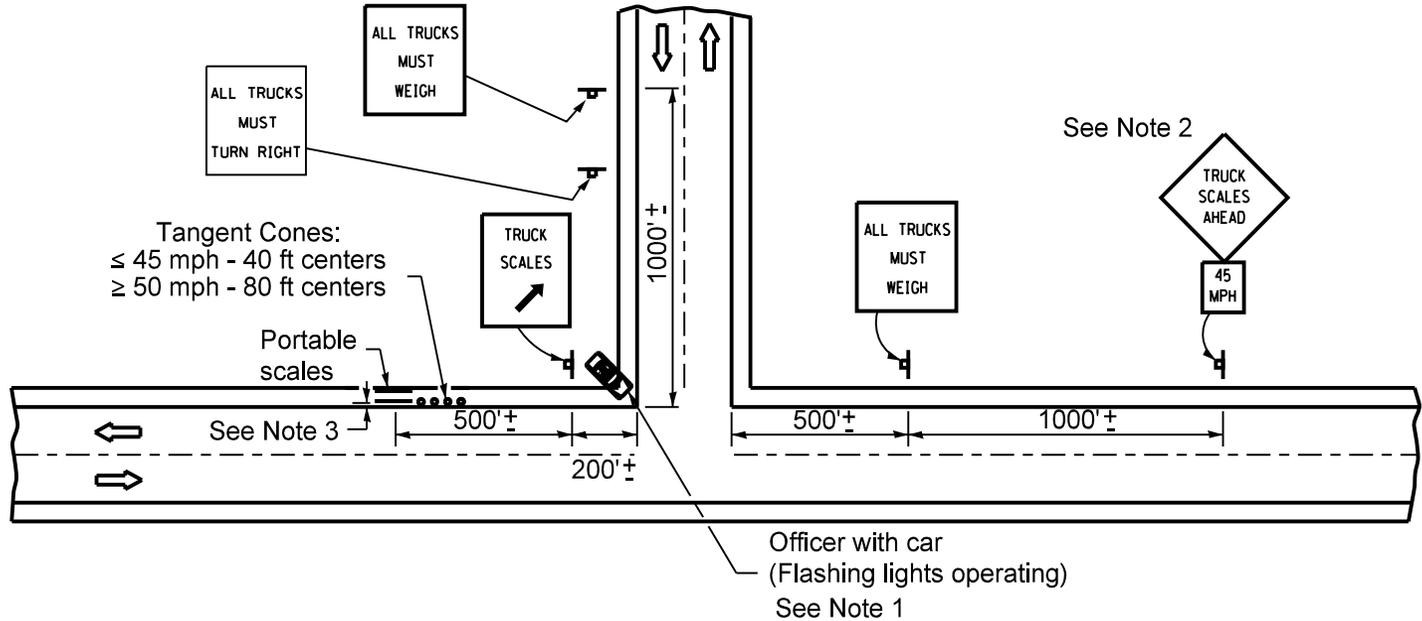


Notes:

WZ W4

1. Workers, vehicles, and equipment should remain on one side of the road.
2. Use advisory speed plate on highways having a posted speed in excess of 45 mph.
3. Scales and cones shall be at least 2 ft from edge of roadway. If the posted speed or operating speeds at the location exceed 40 mph, scales shall be at least 4 ft from edge of roadway.

**STATE-POLICE / IDOT WEIGH SCALES-ONLY
2-LANE, 2-WAY ROADWAY AT INTERSECTION
3-WAY INTERSECTION**

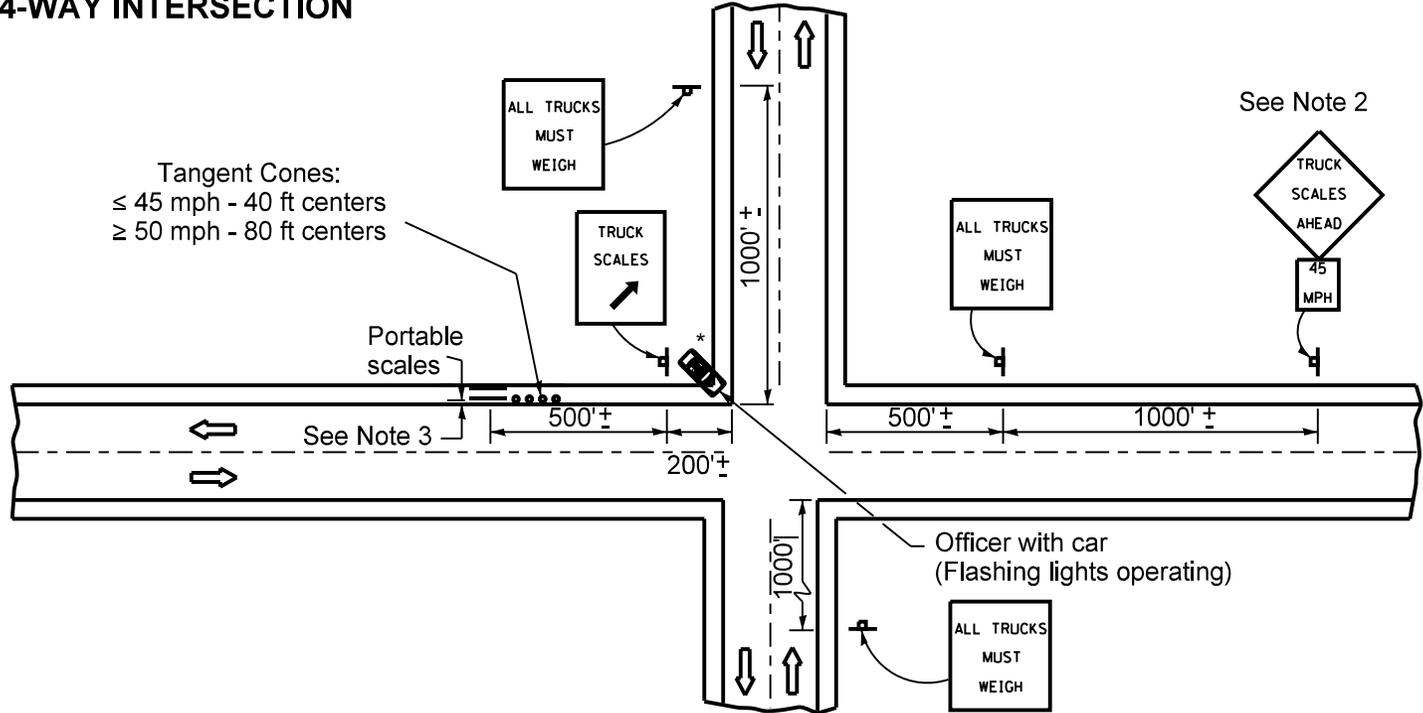


Notes:

1. Workers, vehicles and equipment should remain on one side of the road.
2. Use advisory speed plate on highways having a posted speed in excess of 45 mph.
3. Scales and cones shall be at least 2 ft from edge of roadway. If the posted speed or operating speeds at the location exceed 40 mph, scales shall be at least 4 ft from edge of roadway.

WZ W5

STATE-POLICE / IDOT WEIGH SCALES-ONLY 2-LANE, 2-WAY ROADWAY AT INTERSECTION 4-WAY INTERSECTION



Notes:

1. Workers, vehicles and equipment should remain on one side of the road.
2. Use advisory speed plate on highways having a posted speed in excess of 45 mph.
3. Scales and cones shall be at least 2 ft from edge of roadway. If the posted speed or operating speeds at the location exceed 40 mph, scales shall be at least 4 ft from edge of roadway.

WZ W6

XII. Flaggers' Guide

Preface

The Flaggers' Guide has been prepared to assist IDOT employees to understand the requirements to be a flagger. The procedures, equipment, and recommendations apply to anyone working as a flagger on roadways under the jurisdiction of the Department. Local public agencies (LPAs), contractors, and permit holders may use this guide for work on roadways under other jurisdictions; however, these organizations' employee safety code may be different.

To The Flagger

- The flagger shall be physically able, mentally alert, and sufficiently commanding in appearance to be obeyed by the road users.
- Flaggers have direct responsibility for the safe passage of traffic in a work area. The lives of workers, the traveling public and the flagger depend upon the flagger's alertness and ability to control traffic with the STOP/SLOW paddle. Flaggers should attempt to immediately warn the work crew when a motorist disregards a flagger's signal causing an emergency.

- Flaggers shall be on duty during the installation and removal of equipment and traffic control devices located on any portion of a through traffic lane.
- The flagger is an important position and is one to be carried out with authority and dignity.
- This guide has been prepared to assist the flagger in understanding the flagger duties and should be properly studied and available for immediate reference. Remember, workers and the road users are depending on the flagger.

The Flagger and Public Relations

- When stopping traffic, the flagger should advise the first motorist of the situation in a brief, courteous statement, including an estimate of the delay.
- Don't lean on vehicles or argue with the occupants. Keep your voice calm. The flagger's job demands full concentration.
- All work area signs required by the MUTCD and other approved traffic control plans (contract plans, Work Zone Cases, etc.), shall be installed prior to beginning any operation. The flagger should not be required to control traffic without proper placement of these signs. The signs shall be removed or covered when they are not actually in effect.

- When on duty the flagger should present a neat appearance, be appropriately dressed for protection from the sun, flying objects, and insects. A neat appearance gains respect and makes the flagger's job more effective.
- Any driver that fails to stop when signaled to do so by a flagger or fails to remain in such position until signaled to proceed is in violation of 625 ILCS 5/11-908(c). If the situation warrants, a description of the driver and the vehicle's license number should be recorded and the circumstances reported immediately to the flagger's supervisor or the appropriate law enforcement agency.

Number of Flaggers

- At least two (2) flaggers should be utilized on Two-Lane roadways at all times when one lane is closed. Additional flaggers should be considered by supervising resident or lead worker due to intersection site restrictions, commercial driveways, or other issues that may impact the safety of motorists.
- The number of flaggers may be reduced for spot lane closures where adequate sight distance is available for the reasonably safe handling of traffic. No reduction of flaggers is allowed when a road is open to local traffic only.

For Local Public Agencies only, the following apply:

- For highways with an ADT < 100, no flagger is required unless the operation encroaches into the open lane.
- For highways with an ADT ≥ 100 that the operation encroaches into the open lane and for highways with an ADT ≤ 400 , one (1) flagger is required. When a single flagger is used, the flagger should be stationed on the shoulder opposite the spot lane closure or work space, or in a position where good visibility and traffic control can be maintained at all times.
- Approved temporary traffic signals may be substituted for flaggers at bridge repair projects or other operations where lane closures will last overnight or longer.
- Contractors, Permit Holders, and Utility Companies should refer to page 189 for Additional Requirements.

Flagger Duties

- One (1) of the two (2) flaggers should be designated as the chief flagger for purposes of coordinating movement.

- Flaggers shall use a STOP/SLOW paddle, a flag, or an Automated Flagger Assistance Device (AFAD) to control road users approaching a temporary traffic control zone. The use of hand movements alone without a paddle, flag, or AFAD to control road users shall be prohibited except for law enforcement personnel or emergency responders at incident scenes.
- Flaggers shall be able to communicate with each other verbally, visually, or by two-way radios. Headsets shall not be used.
- Where the end of a one-lane section is not visible from the other end, the last vehicle can be identified by description or license and relayed to the other flagger.
- Each flagger shall be stationed in accordance with the appropriate Work Zone Case or highway standard.
- Flaggers shall comply with all current and applicable safety standards which may include organization employee safety code, MUTCD, Illinois Department of Labor, and/or OSHA.
- Flagging procedures for multilane closures, urban areas and/or other work activities that are not outlined in this Manual and require special consideration should be furnished by the flagger's supervisor.

Flagger Equipment

IDOT's (or respective organization's) Employee Safety Code shall be consulted for detailed information concerning required and recommended employee personal protection equipment.

Required Flagger Equipment for IDOT Personnel (LPAs refer to agencies' safety codes)

- STOP/SLOW paddle
- High-Visibility Safety Apparel meeting current ANSI/ISEA Standard 107 Performance Class 2 meeting the Department's color and reflective striping pattern
- Flagger Ahead Sign (W20-7)
- 2-way radios if flaggers are not able to see the other flaggers (Cell phones or direct connect cellular devices are not allowed. Headsets shall not be used.)
- High visibility Department approved headwear in accordance with the Employee Safety Code.
- Eye protection meeting current ANSI Z87.1.

- Protective helmets meeting current ANSI Z89.1 where there is a possible danger of head injury from impact, or from falling or flying objects
- 6 in. work boots meeting current ASTM F2413 Class 75 for Impact and Compression
- At night, Illuminated Flagger Stations
- At night, High-Visibility Safety Apparel meeting current ANSI/ISEA Standard 107 Performance Class 2 with leggings meeting the Department's color and reflective striping pattern

Recommended Flagger Equipment

- Appropriate Clothing for Weather Conditions (outer garment shall comply with High-Visibility Safety Apparel for day or night) such as thermal coat, raingear, layers.

Additional Flagger Equipment

- Red flags may be used during emergency situations if a STOP/SLOW paddle is not available. The flag shall be of retroreflective material when used at night.

- When flagging in an emergency situation at night in a non-illuminated flagger station, a flashlight with red glow-cone may be used to supplement the STOP/SLOW paddle or flag.
- Automated Flagger Assistance Devices (AFAD) complying with the MUTCD may be used in situations where there is only one lane of approaching traffic in the direction to be controlled.

STOP/SLOW Paddle

- The STOP/SLOW paddle:
 - Should be the primary and preferred hand-signaling device.
 - Should be properly maintained and cared for to ensure condition and legibility (shall be able to read from a 400 ft minimum distance).
 - Shall have an octagonal shape on a rigid handle.
 - Shall be at least 24 in. wide with letters at least 8 in. high. For LPAs on roadways under local jurisdiction, the STOP/SLOW paddle may be 18 in. wide with letters at least 6 in. high.
(See Figure 1)
- The STOP (R1-1) face shall have white letters and a white border on a red background.

- The SLOW (W20-8) face shall have black letters and a black border on an orange background.
- The STOP/SLOW paddle sign faces shall consist of retroreflective sheeting.
- The STOP/SLOW paddle may be modified to improve conspicuity by incorporating either white or red flashing lights on the STOP face, or either white or yellow flashing lights on the SLOW face. The flashing lights shall meet color and location requirements in the MUTCD.

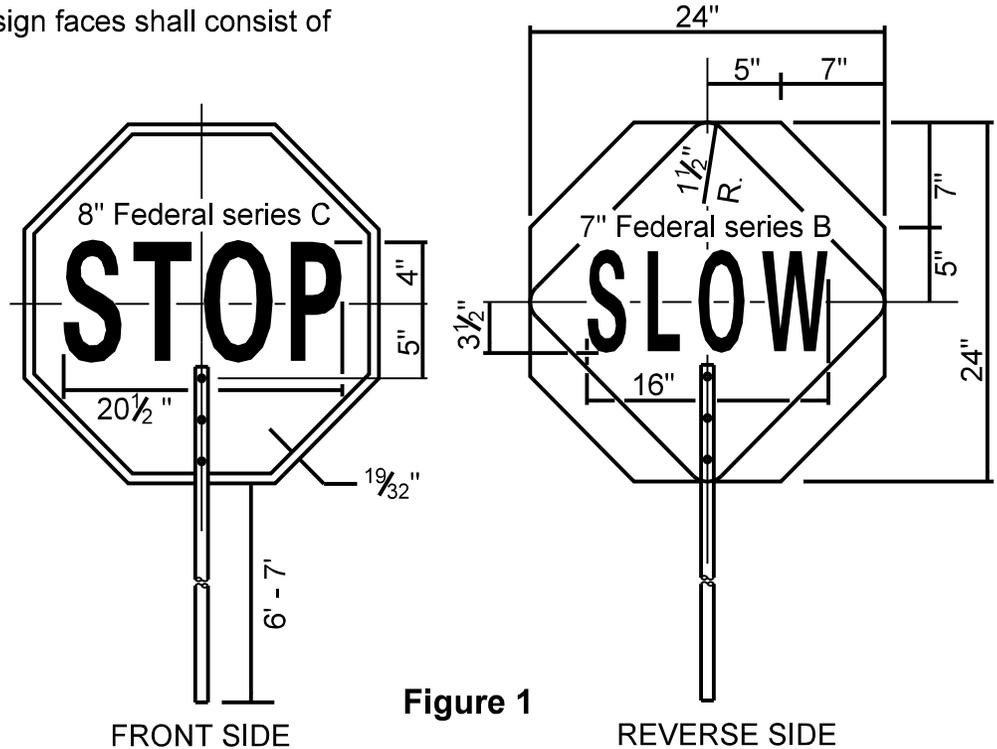


Figure 1

Flagging Procedures to Stop Road Users

- The flagger shall stand in a safe position on the shoulder, and shall be visible to traffic.
- The flagger shall face road users and aim the STOP paddle toward the road users in a stationary position with the arm extended horizontally away from the body.
- The flagger's free arm shall be held with the palm of the hand above the shoulder level toward approaching traffic.
- After the first vehicle has stopped, the flagger shall move to a position near the centerline to ensure the STOP face and flagger are visible to approaching traffic.
- See Figure 2



Figure 2

To Direct Stopped Road Users to Proceed

- When releasing traffic, the flagger shall move to a safe position out of open traffic lanes and face traffic.
- The flagger shall face road users and aim the SLOW paddle face toward road users in a stationary position with the arm extended horizontally away from the body.
- The flagger shall motion with the free hand for road users to proceed.
- See Figure 3



Figure 3

- The flagger shall stand in a safe position on the shoulder, be visible to and facing traffic.
- The flagger shall face road users and aim the SLOW paddle face toward road users in a stationary position with the arm extended horizontally away from the body.
- To further alert or slow traffic, the flagger holding the SLOW paddle face toward road users may motion up and down with the free hand, palm down.
- See Figure 4



W20-8

Figure 4

Multilane Roadways

- Traffic control devices shall be used to control traffic through the work zone.
- When used on multilane roadways, the flagger's responsibility is to protect workers while maintaining traffic speeds at a reasonable level.
- Flaggers shall not aggressively reduce speeds unnecessarily which will result in backups.
- While flagging on a multilane road, the flagger shall remain on the shoulder or in the closed lane. Flaggers and the STOP/SLOW paddles shall not encroach into the open lane of traffic.
- Flaggers on multilane projects shall be positioned in accordance with the appropriate Work Zone Case or Highway Standard.

Signaling with a Flag

- Red Flags may be used during emergency situations if a STOP/SLOW paddle is not available.
- The flag shall be RED, 24 in. X 24 in., and on a 3 ft staff.

- The flag shall be of retroreflective material when used at night.
- The flagger shall stand in a safe position on the shoulder and shall be visible to traffic.
- To stop road users, the flagger shall face road users and extend the flag staff horizontally across the road users' lane in a stationary position so that the full area of the flag is visibly hanging below the staff. After the first vehicle has stopped, the flagger shall move to a position near the centerline to ensure the flag and flagger are visible to approaching traffic. The free arm shall be held with the palm of the hand above shoulder level toward approaching traffic. (See Figure 5)
- To direct stopped road users to proceed, the flagger shall face road users with the flag and arm lowered from the view of the road users, and shall motion with the free hand for road users to proceed. Flags shall not be used to signal road users to proceed. (See Figure 6)
- To alert or slow traffic, the flagger shall face road users and slowly wave the flag in a sweeping motion of the extended arm from shoulder level to straight down without raising the arm above a horizontal position. The flagger shall keep the free hand down. (See Figure 7)

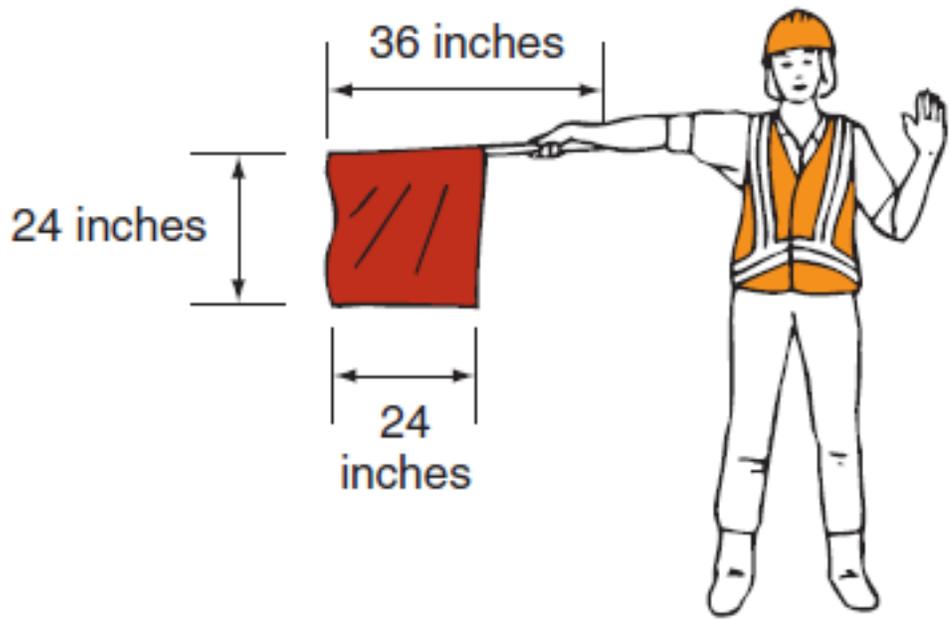


Figure 5



Figure 6



Figure 7

Flagger Rules to "Live" By

- FLAGGERS shall meet the flagger requirements outlined in this Manual and other applicable safety codes and be trained prior to performing flagger duties.
- FLAGGERS shall be relieved at appropriate intervals to avoid fatigue and remain alert.
- FLAGGERS shall not be more than one (1) mile apart on two lane highways.
- FLAGGERS shall not mingle with the work crew.
- FLAGGERS shall not use a cell phone, text, or use the internet.
- FLAGGERS should always maintain two (2) safety escape routes.
- FLAGGERS shall not leave their post unless authorized to do so or when replaced by another flagger.
- FLAGGERS shall not turn their back on approaching traffic.
- FLAGGERS shall not sit while on duty.

- FLAGGERS shall be aware of where equipment and traffic are at all times.
- FLAGGERS shall be visible to oncoming traffic at all times. To be visible:
 - Wear approved high visibility garments at all times.
 - Avoid standing in the shade.
 - Avoid standing in front of equipment.
 - Locate the flagger station in advance of curves, horizontal and vertical.

Additional Requirements for Contract and Permit Work

- 430 ILCS 105/2 requires "the contractor or his authorized agent in charge of such construction will be required to furnish no fewer than 2 flagmen..."
- All flaggers shall be certified by an agency approved by the Department. While on the job site, each flagger shall have in their possession a current flagger certification identification card and a valid driver's license or a current Secretary of State identification card. This flagger certification requirement may be waived by the Engineer for emergency situations beyond the Contractor's control.
- For flagger operations at night, flagger stations shall be illuminated according to the Standard Specifications for Road and Bridge Construction.

Agencies approved by the Department to certify flaggers: <http://www.idot.illinois.gov/Assets/uploads/files/Doing-Business/Manuals-Guides-&-Handbooks/Highways/Safety-Engineering/Work%20Zone%20Safety%20and%20Mobility%20Rule%203-07.pdf>

Available Flagger Training Programs for Contract and Permit Work:

American Traffic Safety Services Association (www.flagger.com)
1.877.642.4637

National Safety Council (www.nsc.org)
1.800.621.2855

IL Laborers' and Contractors Jt. Apprenticeship Program
1.877.773.2741 (downstate Illinois)
1.630.653.0006 (Chicago Metro)

<http://www.idot.illinois.gov/Assets/uploads/files/Doing-Business/Manuals-Guides-&-Handbooks/Highways/Safety-Engineering/Work%20Zone%20Safety%20and%20Mobility%20Rule%203-07.pdf>

For Local Public Agency Employees:

Illinois Technology Transfer Center (<http://www.idot.illinois.gov/transportation-system/local-transportation-partners/county-engineers-and-local-public-agencies/technology-transfer-center/index>)
1.217.785.2350

For Illinois Department of Transportation Employees

Bureau of Safety Programs and Engineering/District Safety Representative

Additional Information/Resources

Federal Highway Administration Work Zone

<http://www.ops.fhwa.dot.gov/wz/index.asp>

Manual on Uniform Traffic Control Devices

<http://mutcd.fhwa.dot.gov>

Illinois Department of Transportation Work Zone

<http://www.idot.illinois.gov/Assets/uploads/files/Transportation-System/Reports/Safety/SHSP/SHSP%202009.pdf#page=67>

Illinois Technology Transfer Center

<http://www.idot.illinois.gov/transportation-system/local-transportation-partners/county-engineers-and-local-public-agencies/technology-transfer-center/index>

Work Zone Safety

www.workzonesafety.org

XIII. Quality Standard for Work Zone Traffic Control Devices

Introduction

When the normal function of the roadway is changed due to work zone activities, temporary traffic control provides for the continuity of movement of motor vehicle, bicycle, and pedestrian traffic. The primary function of temporary traffic control is to provide for the reasonably safe and efficient movement of road users through or around work zones while protecting workers and equipment.

Temporary traffic control is established through a system of devices. The success of this system depends upon the quality and placement of each device.

Routine use of work zone traffic control devices subjects them to greater wear than permanent devices. This wear may be caused by carelessness during the storage, shipping, relocating, and removal of these devices, impacts from traffic or equipment, or simply age. This wear causes deterioration of their appearance. A high percentage of these worn and damaged devices in a project results in a loss of positive guidance to the road user, and an unprofessional appearance that reduces motorist confidence and compliance.

This standard aids the inspector in determining the quality of work zone devices. However, the Engineer is the sole judge of device quality. The devices should be inspected at several stages: while in storage, during preparation for delivery to the work zone, during initial set-up, and periodically during the course of the work. Suppliers and contractors are encouraged to apply this standard prior to delivery of devices to the jobsite. Doing so will minimize Department involvement and reduce time, effort, and costs related to on-site rejection and required replacement.

All devices and combinations of devices shall meet the requirements of the National Cooperative Highway Research Program (NCHRP) Report 350 or the American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH) for their respective categories, in accordance with Bureau of Design and Environment or Bureau of Safety Programs and Engineering special provisions, or the standard specifications.

Application of This Standard

Any traffic control device which has become ineffective due to damage, wear, or defacement shall be replaced by the Contractor. All traffic control devices shall be maintained and kept clean such that the device maintains its appearance and retroreflectivity (if applicable) according to the guidance of this standard at a minimum. The Engineer shall be the sole judge as to the acceptability of the quality, placement, and maintenance of all traffic control devices.

Quality Classifications and Requirements

The quality of the work zone devices in this standard is divided into three (3) categories, **acceptable**, **marginal**, and **unacceptable**.

Acceptable devices are in new or like-new condition. They meet all applicable IDOT standards, specifications, and manufacturer's specifications.

Marginal devices are similar to acceptable, but are worn.

Unacceptable devices do not meet specifications, standards, or manufacturer's specifications. Any unacceptable device shall be replaced.

At the time of the initial set-up and at the time of major stage changes, 100 percent of each type of device shall be acceptable. The following table describes the percentage of each device type that shall be rated as acceptable and the maximum allowed to be rated as marginal for the entire installation to remain acceptable.

DEVICE	INITIAL SET-UP	DURING PROJECT	
		ACCEPTABLE	MARGINAL
SIGNS	100%	75%	25%
BARRICADES	100%	75%	25%
VERTICAL PANELS	100%	75%	25%
DRUMS	100%	75%	25%
CONES	100%	75%	25%
STOP/SLOW PADDLE	100%	75%	25%
TEMPORARY CONCRETE BARRIER	100%	75%	25%
SAND MODULE IMPACT ATTENUATOR	100%	95%	5%
WARNING LIGHTS	100%	90%	10%
TEMPORARY PAVEMENT MARKING	100%	90%	10%
REFLECTORS	100%	90%, no more than 2 consecutive missing	N/A

Devices used in a small quantity, such as Arrow Boards and Portable Changeable Message Signs (PCMS), shall be evaluated individually.

When required, inspections shall be documented using Form BSE 726, Traffic Control Inspection Report.

The following photographs, together with the contract requirements of each specific project, shall be used as a guide to determine if the device is **acceptable**, **marginal**, or **unacceptable**. A direct comparison of each device to this standard is not required for the rejection of devices.

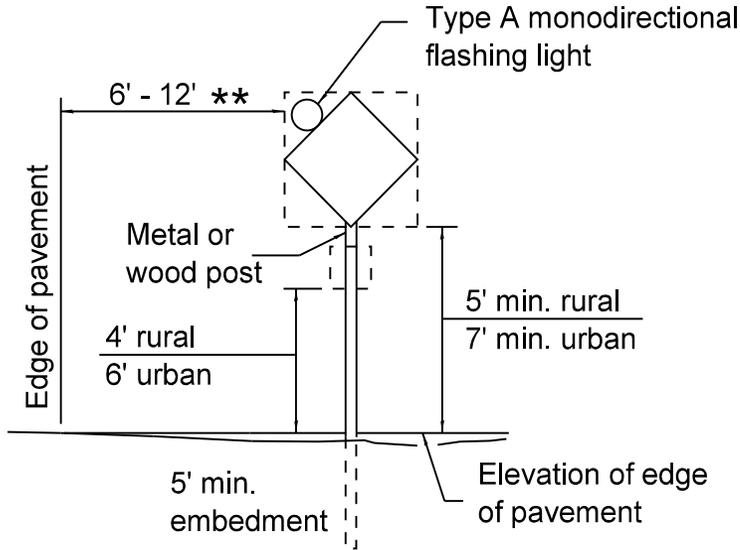
Quality Standard for Signs

This standard applies to all signs, warning, regulatory and guide, furnished by a supplier, subcontractor, or contractor to be used for traffic control in work zones.

All standard signs shall conform to the requirements of the contract documents, the MUTCD, and supporting manuals. In complying with these requirements, the contractor and suppliers will furnish signs that are correct in size, shape, color, and legend. The Standard Specifications provides the requirements for retroreflectivity of work zone signs.

Pages 198-199 is used to evaluate the quality of the sign face only. **If any sign is bent, dented, or deformed to the extent that its shape is nonstandard or a portion of the sign is missing, the sign is unacceptable.**

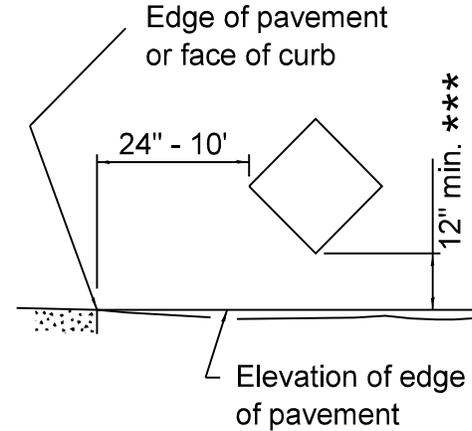
TYPICAL SIGN INSTALLATIONS



POST MOUNTED SIGNS

** When curb or paved shoulder are present this dimension shall be 24 in. to the face of curb or 6 ft to the outside edge of the paved shoulder.

All heights shall be measured above the edge of pavement surface.



SIGNS ON TEMPORARY SUPPORTS

*** When work operations exceed four days, this dimension shall be 5 ft min. If located behind other devices, the height shall be sufficient to be seen completely above the devices.

Orange work zone signs shall be fluorescent orange in color. Signs shall have retroreflective sheeting. Signs with bends and dents that alter the size and/or shape of the sign are unacceptable. These photos are examples of the condition of the sheeting.

Acceptable—An Acceptable sign is new, or in like-new condition. There may be abrasions on the surface but very little loss of lettering. There has been no touch-up of the lettering.



Marginal – A marginal sign has wear, but is readable. It may have many surface abrasions throughout the sign face or within the individual letters of the message. The sign surface is free of any residue. Although some color fading is evident, the background color and retroreflectivity are still apparent at night.

Unacceptable - This is an example of an **unacceptable** sign. Signs with asphalt splatter and/or cement slurry, or large areas of missing and/or covered reflective material are **unacceptable**. Letters are more than 50 percent deteriorated. There is noticeable color fading.



Quality Standard for Barricades and Vertical Panels

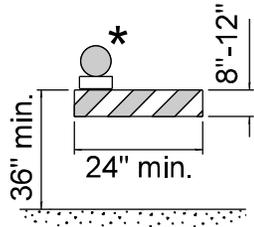
This standard applies to Type I, II and III barricades, vertical barricades, direction indicator barricades and panels furnished by a supplier, subcontractor, or contractor for traffic control use in work zones.

Barricade type and placement of barricades and vertical panels are specified in the contract documents. Vertical panels shall be erected and maintained in a vertical position.

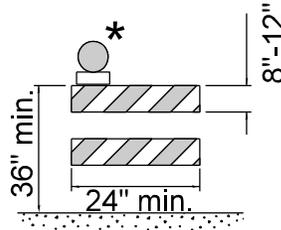
Page 202 is used to evaluate the quality of the retroreflective portions of barricades and vertical panels. In addition to this evaluation, device supports must also be evaluated. **Any one or combination of the following will cause the device to be unacceptable:**

- Deformation of the support assembly so the sheeted panel is not oriented correctly.
- Device is bent or legs are twisted.
- Rusty metal parts.
- Unpainted wooden rails.
- Broken panels.
- Does not meet NCHRP 350 or MASH requirements.

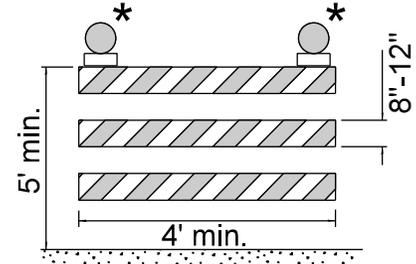
TYPICAL DRAWINGS OF TYPE I, II, AND III BARRICADES, DIRECTION INDICATOR BARRICADES AND VERTICAL PANELS



TYPE I BARRICADE

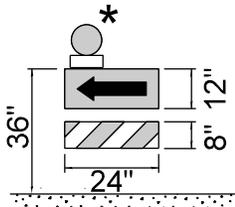


TYPE II BARRICADE



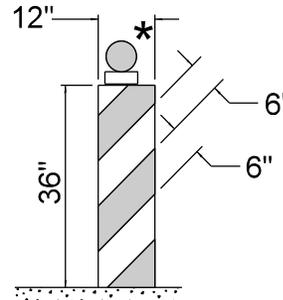
TYPE III BARRICADE

* Warning Lights (If Required)

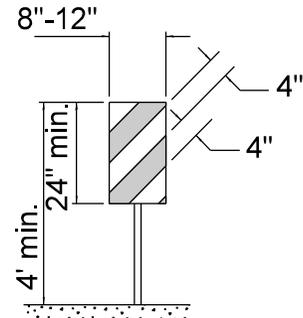


**DIRECTION INDICATOR
BARRICADE**

The arrow panel in direction indicator barricades shall conform to the Quality Standard for Signs.



VERTICAL BARRICADE



**VERTICAL PANEL
POST MOUNTED**

Acceptable—An Acceptable panel is new, or in like-new condition. There may be abrasions on the surface but very little loss of retroreflective sheeting. The orange is vivid, and the stripes provide contrast that is clearly visible with low beam headlights at night.



Marginal – A marginal panel has wear, but is in good condition. There are surface abrasions throughout the panel surface. Some color fading is evident. However, it is free of large areas of residue or missing reflective material. The colors, stripes, and reflectivity are visible and discernible with low beam headlights at night.

Unacceptable – This is an example of an **unacceptable** panel. The surface is marred over large portions of the panel area. There is noticeable loss of reflectivity and obvious color fading. Panels with asphalt splatter and/or cement slurry, or large areas of missing and/or covered reflective material make a panel **unacceptable**.

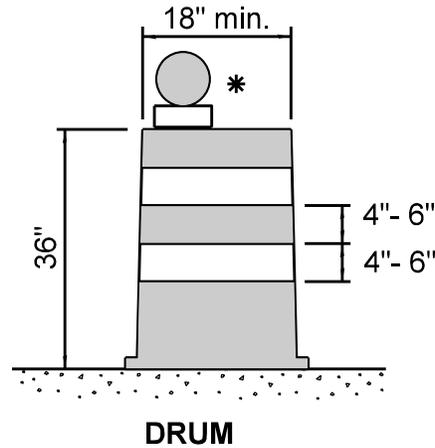


Quality Standard for Drums

This standard applies to drums that are furnished by a supplier, subcontractor, or contractor for traffic control in work zones.

Drum placement is specified in the contract documents. Pages 204-205 is used to evaluate the general appearance of drums. In addition, drums that are dented severely enough to affect their overall dimension and shape, or contain fractures that affect their stability or ability to retain the retroreflective sheeting are unacceptable.

**TYPICAL DRAWINGS
OF DRUMS**



*** Warning Light (If Required)**

Acceptable – An acceptable drum is new, or in like-new condition. The sheeting has only minor tears and scratches. It will readily respond to washing.



Marginal – A marginal drum has wear, but is in good condition. The sheeting has tears and scratches; however, it is free of large areas of residue or missing retroreflective material. Some fading is evident. It may not readily respond to washing.



Alternating white and fluorescent orange retroreflective sheeting is required on drums. All non-reflectORIZED portions of the drums shall be orange.

Unacceptable - This is an example of an **unacceptable** drum. The large areas of missing retroreflective material make this drum **unacceptable**. Drums with asphalt splatter and/or cement slurry, or any large areas of missing and/or covered retroreflective material make a drum **unacceptable**. Large areas of fading are evident. It will not respond to washing.



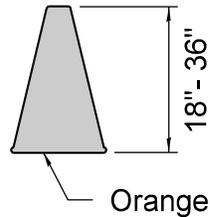
Quality Standard for Cones

This standard applies to cones that are furnished by a supplier, subcontractor, or contractor for traffic control in work zones.

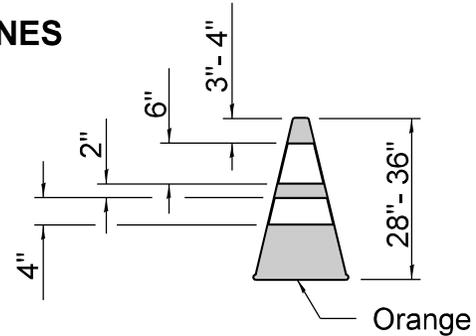
Cone placement and required minimum height is specified in the contract documents. Cones used in work zones shall be orange in color.

Page 207 is used to evaluate the general appearance of cones. In addition, cones that contain fractures that affect their stability are unacceptable.

TYPICAL DRAWINGS OF CONES



CONE



REFLECTORIZED CONE

Acceptable – An acceptable cone is new or in like-new condition. Surfaces are free of punctures and abrasions, and the color is bright. The surfaces may be dirty, but will readily respond to washing.



Marginal – A marginal cone has wear, but is in good condition. The sheeting has tears and scratches, but it is free of large areas of residue or missing retroreflective material. Some fading is evident. It may not readily respond to washing.



Unacceptable - This is an example of **unacceptable** cones. It has punctures or large areas of missing and/or covered retroreflective material. Large areas of asphalt splatter and/or cement slurry make cones **unacceptable**.

Quality Standard for Stop/Slow Paddle

This standard applies to paddles furnished by a supplier, subcontractor, or contractor for traffic control in work zones.

Paddles used in work zones shall meet the requirements of the Highway Standards and the Standard Specifications. In complying with these requirements, the contractor and suppliers will furnish signs that are correct in size, shape, color and legend.

The "STOP" face shall consist of white letters and border on a background of red retroreflective sheeting. The "SLOW" face shall consist of black letters and border on a background of fluorescent orange retroreflective sheeting. Area outside sign borders shall be light blue or black. The staff may consist of two (2) sections joined by a coupling.

Page 209 should be used to evaluate the general appearance of Stop/Slow paddles.

Acceptable – An acceptable paddle is new or in like-new condition. There may be abrasions on the surface but very little loss of lettering. There has been no touch-up of the lettering. The sheeting color is vivid with contrasting colors. The paddle is not less than 6 ft or more than 7 ft from pavement to bottom of sign. The surface may be dirty but will readily respond to washing.



Unacceptable - This is an example of an unacceptable paddle. Paddles with asphalt splatter and/or cement slurry throughout the face of this sign are unacceptable. Large areas of sheeting are missing. Some letters have a loss of more than 20 percent. Color fading is noticeable.



Marginal – A marginal paddle has wear, but is readable. It may have many surface abrasions throughout the sign face or within the individual letters of the message. The paddle surface is free of any residue. Although some color fading is evident, the background color and retroreflectivity are still apparent at night. The surface is dirty and may not be readily cleaned.



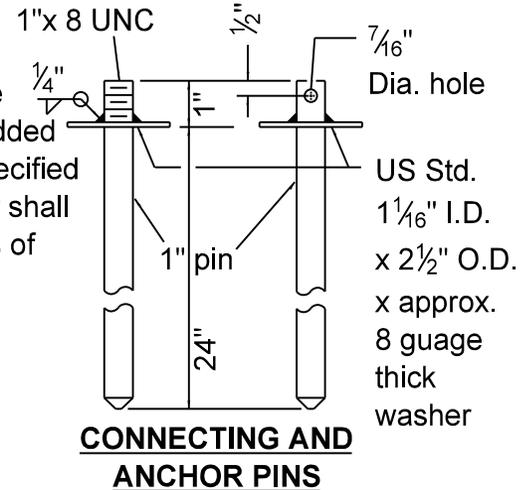
Quality Standard for Temporary Concrete Barrier

This standard applies to temporary concrete barrier furnished by a supplier, subcontractor, or contractor for traffic control in work zones. Temporary concrete barrier shall conform to the Standard Specifications and Highway Standards. Temporary concrete barrier shall be identified as Illinois F Shape by stamp or paint. Temporary concrete barrier shall meet FHWA crashworthy standards Category 3, Test Level 3 requirements.

The barrier unit at each end of the installation shall be secured to the pavement or paved shoulder using six (6) anchoring pins fully embedded and protected with an accepted FHWA crashworthy device of the specified Test Level as shown on the plans. Each approach end of the barrier shall be shielded with an approved crashworthy end treatment, regardless of placement within or outside the clear zone.

Connecting pins and anchor pins shall be according to the Highway Standards.

Pages 211-214 should be used to evaluate the general appearance of temporary concrete barrier. See page 226 for criteria regarding barrier wall reflectors.



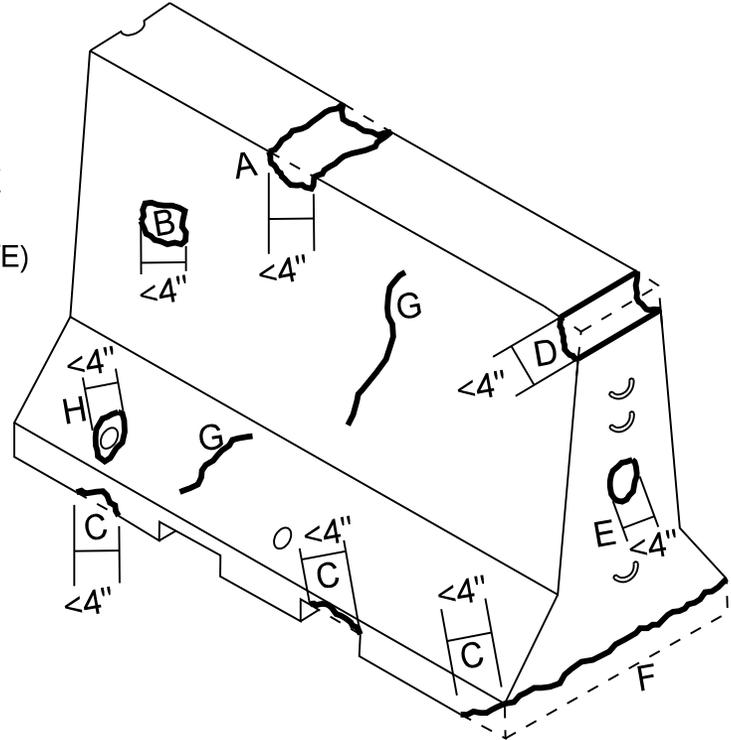
(End may be beveled $\frac{1}{4}$ " max.)

Acceptable: Acceptable temporary concrete barrier wall is new or in like-new condition with few blemishes. Spalls and chipped concrete are no greater than 1.5 in. in depth. Connecting loop bars are in place and in good condition.



Marginal: Marginal temporary concrete barrier wall has minor spalls with hairline cracks, and minor imperfections along the base. It is still structurally sound. There are no exposed rebar. Connecting loop bars are in place and in good condition.

**TYPICAL SAFETY
SHAPE DEFECTS**
(NOT ALL INCLUSIVE)



This diagram illustrates some defects that are considered marginal conditions for temporary concrete barrier units. The following page describes these defects deemed to be marginal.

- A. Spall on top of barrier, less than 4 in. measured horizontally, vertically, or diagonally and less than 1.5 in. in depth.
- B. Spall on surface of barrier, less than 4 in. measured horizontally, vertically, or diagonally and less than 1.5 in. in depth.
- C. Spall on bottom of barrier, less than 4 in. measured horizontally, vertically, or diagonally, provided the condition does not create a snag point or compromise the safety shape.
- D. Spall on top corner of barrier, less than 4 in. measured horizontally, vertically, or diagonally, provided the condition does not create a snag point or compromise the safety shape.
- E. Spall on the end face of barrier, less than 4 in. measured horizontally, vertically, or diagonally, provided the condition does not interfere with connecting loop bars.
- F. Spall on bottom corner of barrier, less than 4 in. measured horizontally, vertically, or diagonally, provided the condition does not create a snag point or compromise the safety shape.
- G. Crack tightly compressed, no longer than 1 ft, exhibiting no surface displacement and not combined with other defects.
- H. Spall around pin hole, less than 4 in. measured horizontally, vertically, or diagonally.



Unacceptable: These are examples of unacceptable temporary concrete barrier wall. The barrier wall has large spalls and cracks, with unsound concrete that could easily dislodge when hit. Rebar is exposed. The spalled wall may cause tire damage if hit, especially along the base. Spalled concrete may cause the vehicle to "snag" and twist from the direction it is going. Any spall greater than 1.5 in. in depth or a broken/damaged connecting loop is cause for rejection.



Quality Guideline for Impact Attenuators, Temporary Sand Module Impact Attenuators

This guideline applies to sand module impact attenuators furnished by a supplier, subcontractor, or contractor for traffic control in work zones.

Sand module impact attenuator placement is specified in the contract documents. Temporary Impact Attenuators shall be fitted with alternating Type AA or AP fluorescent orange and retroreflective white horizontal circumferential stripes. Striping shall encircle the entire drum, and there shall be two (2) of each stripe on each module.

Sand module arrays shall retain the correct number and size of modules throughout construction, as shown in the plans and per manufacturer specifications.

Lids shall be secured and shall prevent water infiltration. Only sand shall be placed within the attenuator modules. Sand that exceeds the maximum allowable moisture content as stated in the Standard Specifications shall be replaced. For winter applications, sodium chloride should be blended with the sand in accordance with the manufacturer's recommendations.

The Engineer shall be the sole judge as to the acceptability of damaged sand attenuators.

Pages 217-218 should be used to evaluate the general appearance of sand module impact attenuators.

Other Temporary Impact Attenuators

When other temporary impact attenuators are allowed, the following guidelines shall apply:

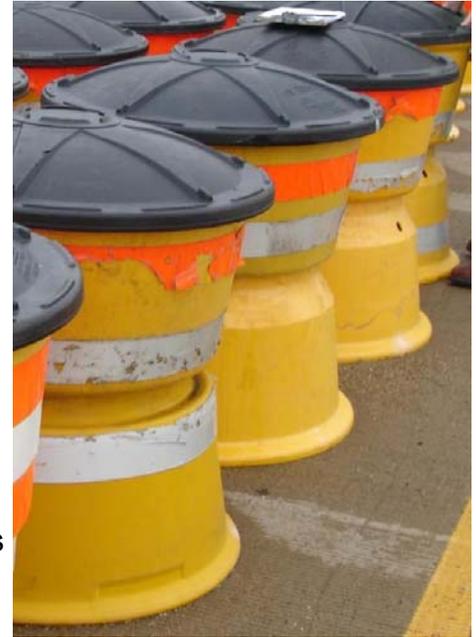
- Any element of the impact attenuator that has been damaged, deformed or bent will not be allowed and shall be repaired to meet NCHRP 350 or MASH requirements.
- All elements of the device shall be in place and installed in accordance with the manufacturer's specifications to meet NCHRP 350 or MASH requirements.
- The devices shall be delineated with a terminal marker on the nose, and reflectors along the sides, when specified.

Acceptable: No cracks or holes. All retroreflective stripes are present and fully encircle the device. Device has not been damaged. Sand has no more moisture content than as stated in the standard specifications.



Marginal: When any of the following conditions exist:
1) Any small holes can be easily patched. 2)

Cracks are shorter than 1/4 of the smallest diameter of the drum in any direction. 3) The structural integrity of the drum has not been affected. 4) Stripes have some loss of material.



Unacceptable: When any of the following conditions exist: 1) All holes cannot be easily patched. 2) There is a crack which is longer than 1/4 of the smallest diameter of the drum in any direction. 3) The attenuator has been damaged such that it affects the structural integrity of the drum. 4) Retroreflective stripes are missing or do not fully encircle the drum. 5) Missing module(s). 6) Sand has become saturated. 7) Sand is bagged or other materials than sand is used.



Quality Guidelines for Warning Lights

This guideline applies to Type A low intensity flashing lights and Type C low intensity steady burning lights furnished by a supplier, subcontractor, or contractor for traffic control in work zones.

Warning light type, placement, and material requirements shall be as specified in the applicable traffic control standard and the Standard Specifications. Lights shall face the approaching traffic. For lights to be used in work zones, all the above requirements shall be met to the satisfaction of the Engineer.

Batteries for the lights shall be replaced on a group basis at such times as may be specified by the Engineer.

Lights shall be maintained so as to be visible on a clear night from a distance of 3000 ft.

Evaluation Guide -- Lights

Acceptable: When 100 percent of the Type A or C lights are functioning and meet the above requirements.

Marginal: When all the following conditions exist: 1) More than 90 percent of the Type A or Type C lights are functioning. 2) No more than three (3) consecutive failed lights. 3) The lights meet the above requirements.

Marginal for Tapers: When all the following conditions exist: 1) No more than two (2) failed lights.
2) The lights meet the above requirements.

Unacceptable: When any of the following conditions exist: 1) Less than 90 percent of the Type A or Type C lights are functioning. 2) Four (4) or more consecutive failed lights. 3) The lights do not meet the above requirements.

Unacceptable for Tapers: When any of the following conditions exist: 1) More than two (2) failed lights.
2) The lights do not meet the above requirements.

Quality Guideline for Arrow Boards

This guideline applies to arrow boards that are furnished by a supplier, subcontractor, or contractor for traffic control in work zones.

Arrow board placement shall be as specified in the applicable traffic control standard, the Standard Specifications, and the Traffic Control Plan. For arrow boards to be used in work zones, all the above requirements shall be met to the satisfaction of the Engineer.

Any arrow board which is out of alignment from the driver's line of vision or not placed within five (5) degrees of a horizontal position (1 in/1 ft) shall be an unacceptable device.

The Standard Specifications indicate minimum legibility distances.

Evaluation Guide -- Arrow Boards

FLASHING ARROW MODE

Acceptable: All lamps or LEDs are functioning and the arrow board is dimming properly.

Marginal: Two (2) or less lamps or LEDs non-functioning total, with only one (1) lamp or LED non-functional in the head of the arrow. The arrow board is dimming properly.

Unacceptable: When any of the following conditions exist: 1) Three (3) or more lamps or LEDs non-functioning total. 2) Two (2) or more lamps or LEDs non-functioning in the head of the arrow. 3) The arrow board is not dimming properly.

CAUTION MODE

Acceptable: All lamps or LEDs are functioning and the arrow board is dimming properly.

Marginal: Minimum of four (4) lamps or LEDs functioning and dimming properly.

Unacceptable: When the following conditions exist: 1) Three (3) or less lamps or LEDs functioning. 2) The arrow board is not dimming properly.

Quality Guideline for Work Zone Pavement Marking

This guideline applies to work zone pavement markings that are furnished by a supplier, subcontractor, or contractor for traffic control in work zones.

Work zone pavement marking placement shall be as specified in the applicable traffic control standard, the Standard Specifications, and the Traffic Control Plan. The Standard Specifications provide requirements for pavement marking materials. All the above requirements shall be met to the satisfaction of the Engineer.

Evaluation Guide -- Work Zone Pavement Markings

Acceptable: All pavement markings required are in place and meets the above specifications.

Marginal: Ninety percent (90%) or more of all pavement markings are present, and no more than two (2) consecutive skip lines are missing, and less than 50 ft of continuous solid line is missing or nonreflective.

Unacceptable: When any of the following conditions exist: 1) Less than ninety percent (90%) of all pavement markings are present, 2) Three (3) or more consecutive skip lines are missing. 3) More than 50 ft of continuous solid line are missing or nonreflective.

Quality Guidelines for Removal of Conflicting Pavement Markings

This guideline applies to the removal of conflicting pavement markings by a subcontractor or contractor for traffic control in work zones.

Work zone pavement markings removal shall be as specified in the applicable traffic control standard, the Standard Specifications, and the Traffic Control Plan.

Consideration should be given to removal of existing pavement markings adjacent to edge lines, but outside the traveled way, which conflict with the new travel pattern.

All the above requirements shall be met to the satisfaction of the Engineer.

This guideline applies to pavement marking removal performed by the Contractor for traffic control in work zones.

Pages 224-225 should be used to evaluate the general appearance of removal of conflicting pavement markings.

Acceptable: All conflicting pavement markings have been removed, and the removal meets the above specifications.



Marginal: No more than ten percent (10%) of conflicting markings are present. No more than ten percent (10%) of any individual conflicting line is present.



Unacceptable: When any of the following conditions exist:

- 1) More than ten percent (10%) of conflicting markings are present.
- 2) Conflicting letters or symbols are present.
- 3) More than ten percent (10%) of any individual conflicting line is present.
- 4) Lines or markings are present outside of new traveled way that may confuse road users.



Quality Guideline for Reflectors on Pavement or Barrier Wall

This guideline applies to reflectors used in work zones to delineate the pavement or temporary concrete barrier that are furnished by a supplier, subcontractor, or contractor for traffic control in work zones.

The placement of pavement or temporary concrete barrier reflectors shall be as specified in the applicable traffic control standard and the Traffic Control Plan. The Standard Specifications provide requirements for the reflectors. All the above requirements shall be met to the satisfaction of the Engineer.

The color of the reflectors shall be as specified in the contract or shall match the color of the pavement marking they are supplementing; otherwise the reflectors are unacceptable.

Evaluation Guide -- Reflectors, Pavement Marking and Barrier Wall

Acceptable: All reflectors are in place and meet the above specifications.

Marginal: Ninety percent (90%) or more of all reflectors are present, having no more than two (2) consecutive reflectors missing.

Unacceptable: When any of the following conditions exist: 1) Less than ninety percent (90%) of all reflectors are present. 2) Three (3) or more consecutive reflectors are missing. 3) Reflector colors are incorrect. 4) Reflectors are not bi-directional or placed back-to-back, where required.

Quality Guideline for Painting Curbs and the Slope of Temporary Concrete Barrier

This guideline applies to painting the slope of curb and lower slope of temporary concrete barrier to supplement the delineation of the pavement markings that are furnished by a supplier, subcontractor, or contractor for traffic control in work zones.

The placement of paint on curb or the lower slope of temporary concrete barrier shall be as specified in the applicable contract documents and the Traffic Control Plan. All the above requirements shall be met to the satisfaction of the Engineer.

The curb or lower slope of the temporary concrete barrier wall color shall be as specified in the contract or shall match the color of the pavement marking it is supplementing.

Pages 228-229 should be used to evaluate the general appearance of painting the slope of temporary concrete barrier.

Acceptable: Curb or lower slope has correct temporary marking in place and meet the above requirements.



Marginal: When any of the following conditions exist: 1) No more than two (2) consecutive barrier units have different colors on the lower slope of the wall. 2) No more than 25 ft of curb or no more than one (1) barrier unit has different color than the pavement marking it is supplementing.



Unacceptable: When any of the following conditions exist: 1) Two (2) or more consecutive barrier units have different colors on the slope of the wall. 2) More than 25 ft of curb or the lower slope of the barrier unit has colors incorrect not matching the pavement marking it is supplementing.



Quality Guideline for Portable Changeable Message Signs

This guideline applies to portable changeable message signs (PCMS) that are furnished by a supplier, subcontractor, or contractor for traffic control in work zones.

PCMS placement shall be as specified in the applicable traffic control standard, the Standard Specifications, and the Traffic Control Plan. The Standard Specifications provide the requirements for PCMS. For PCMS to be used in work zones, all of the above requirements shall be met to the satisfaction of the Engineer.

Any PCMS which is not visible from 1300 ft under both day and night conditions and the letters are not visible from 750 ft shall be considered an unacceptable device.

Any PCMS which is out of alignment from the driver's line of vision or not placed within five (5) degrees of a horizontal position (1 in/1 ft) shall be considered to be an unacceptable device.

Evaluation Guide -- Portable Changeable Message Signs (PCMS)

Acceptable: All lamps, discs, or LEDs are functioning and the PCMS is dimming properly.

Marginal: No more than two (2) lamps, discs, or LEDs are non-functioning per each character, with no more than four (4) lamps or discs non-functioning per message, and the PCMS is dimming properly.

Unacceptable: When any of the following conditions exists: 1) Three (3) or more lamps, discs, or LEDs are non-functioning per character, or five (5) or more are non-functioning per message. 2) The PCMS is not dimming properly. 3) More than three (3) phases are displayed.

Quality Guideline for Personal Protective Equipment

This guideline applies to all personnel, on foot, excluding flaggers, within the highway right-of-way.

The Standard Specifications require that "All personnel shall wear fluorescent orange, fluorescent yellow/green, or a combination of fluorescent orange and fluorescent yellow/green meeting the requirements of ANSI/ISEA 107-2004 or ANSI/ISEA 107-2010 for Conspicuity Class 2 garments."

Page 232 should be used to evaluate the general appearance of garments (Vests shown).

Acceptable: An acceptable garment is new, or in like-new condition. The color contrast is vivid, has high reflectivity, is not faded or soiled, and is visible from 1000 ft.



Marginal: A marginal garment has good reflectivity, but exhibits some soiling and light fading of material.

Unacceptable: An unacceptable garment has poor reflectivity. It has significant fading or soiling. Colors have poor contrast. It is not visible from 1000 ft away day or night.

