

B - SIGNS (GENERAL)

B-1 Design of Signs

Street or highway construction, maintenance, and utility signs fall into the same three major categories as do other traffic signs; namely, Regulatory, Warning, and Guide Signs. Many signs normally used elsewhere will also find application for road or street work. Special construction and maintenance signs follow the basic standards for all highway signs as to shape. The sign colors are as prescribes in the design of respective signs. Warning signs for work areas described herein shall have a Black legend on an Orange background to accentuate these hazardous areas. Existing Yellow warning signs already in place within these areas may remain in use unless otherwise directed by the Traffic Engineer.

The use of stripes (other than the standard border) or other geometric patterns or contrasting colors on or around any sign in an attempt to make it more conspicuous, distracts attention from the message, and defeats the purpose of maintaining uniformity and simplicity of design. Such practice is contrary to standards and is accordingly disapproved. The use of standard Orange flags or flashing lights in conjunction with signs is permitted, so long as they do not interfere with a clear view of the sign face.

The dimensions of the signs shown herein are for standard sizes, which may be increased wherever necessary for greater legibility or emphasis. On secondary highways and city streets, smaller signs may be used if authorized. Deviations from standard sizes as prescribed herein shall be in six-inch increments. All signs shall have rounded corners with a minimum 1.5" radius.

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Standard sign sizes and colors are shown in the illustrations of the individual signs rather than in detailed specifications in the text. All signs shall be made of an NCHRP 350 approved substrate, except wood, with reflective sheeting meeting the following specifications.

Reflective Sheeting Specifications

The reflective sheeting shall consist of a retroreflective lens system having a smooth outer surface. The sheeting shall be weather resistant and have a protected precoated adhesive backing.

Sheeting is divided into three categories of sign sheeting:

1. Hi-Intensity
2. Extra Grade
3. Temporary Flexible Warning Sign

All traffic control devices requiring reflective sheeting shall have, as a minimum, “Hi-Intensity” sheeting. “Extra Grade” shall be used where specified and may be used in lieu of “Hi-Intensity” on other devices.

“Hi-Intensity”

Reflective sheeting that meets ASTM D4956-99 Type III requirements shall be used where “Hi-Intensity” requirements are specified. The following minimum coefficient of retroreflection (RA) table applies:

Type III Sheeting

Observation Angle Deg.	Entrance Angle Deg	White	Yellow	Orange	Green	Red	Blue	Brown
0.1	- 4	300	200	120	54	54	24	14
0.1	+30	180	120	72	32	32	14	10
0.2	- 4	250	170	100	45	45	20	12
0.2	+30	150	100	60	25	25	11	8.5
0.5	- 4	95	62	30	15	15	7.5	5
0.5	+30	65	45	25	10	10	6	3.5

“Extra Grade”

Reflective sheeting that meets the following “Minimum Coefficient of Retroreflection” (RA) shall be used where “Extra Grade” requirements are specified.

Further, the sheeting must be approved by DeIDOT.

The two current approved sheeting are:

1. 3M “Diamond Grade”
2. Stimsonite “6200 Prismatic”

* 3. Reflexite Endurance

Observation Angle Deg.	Entrance Angle Deg	White	Yellow	Orange	Green	Red	Blue	Brown
0.1	4	850	675	400	85	200	45	34
	30	400	350	160	40	74	22	14

Temporary Flexible Warning Sign Sheeting

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Temporary Flexible Warning Sign Sheeting shall be made from materials that will meet, as a minimum, the “Hi-Intensity” specifications for reflectivity. If the signs are for nighttime use, the sign sheeting shall be made from materials that they meet, as a minimum, the “Extra Grade” specification for reflectivity. These sign blanks shall be suitable for making maintenance, utility, and construction signs which meet all the requirements of the Manual on Uniform Traffic Control Devices. These are commonly referred to as roll-up signs.

B-2 Position of Signs

Signs shall be placed in positions where they will convey their message most effectively and placement must, therefore, be accommodated to highway design and alignment. Signs shall be so placed that the driver will have adequate time for response.

As a general rule, signs shall be located on the right-hand side of the street or roadway. It may be necessary or desirable at times to erect signs on the left-hand side only. The engineer shall make this determination. Where special emphasis is deemed necessary, (dual highways where the median is wide enough to permit installation of signs) dual installations shall be made which consist of duplicate signs opposite each other on the left and right sides of the roadway, respectively. Within a construction, maintenance or utility area, however, it is often necessary and/or desirable to erect signs on temporary portable supports placed within the roadway itself.

Signs erected on posts at the side of any roadway for the purpose of warning an approaching motorist of a lane closure or roadway obstruction shall be mounted at a height of at least seven (7) feet measured from the bottom of the sign to the near edge of the pavement. Signs erected on skids or other temporary supports shall be mounted at a height of at least five(5) feet measured from the bottom of the sign to the near edge of the pavement (see Page 99).

Signs may also be mounted on barricades when approved, however, they shall be mounted at a height of not less than two (2) feet. All measurements are from the bottom of the sign to the pavement level.

Where open highway conditions prevail on the approach to the work site, advance warning signs shall be placed approximately 1,500 feet in advance of the work site. The warning sign nearest the work site shall be placed approximately 500 feet from the point of restriction with the additional signs at 500-1,000 foot intervals. On expressway and limited access facilities the advance warning distance shall be increased to one-half mile. On city streets where more restrictive conditions generally prevail on the approach to the work area, signs in the immediate vicinity of the work may be placed at closer spacing. Typical sequence and spacing of advance warning signs are shown in Cases located at the back of this Manual.

B-3 Erection of Signs

Signs on fixed supports are usually mounted on a single post, although those wider than thirty-six (36) inches or larger than ten (10) square feet shall be mounted on two (2) posts. The post(s) used must meet Federal breakaway standards unless located behind barrier or guardrail. Signs mounted on portable supports are suitable for temporary conditions as approved by the Chief Traffic Engineer or his authorized representative. Skids and collapsible metal sign supports are typical portable supports. These portable supports will need to comply with the new FHWA NCHRP-350 standards once adopted. All such installations shall be so constructed to yield upon impact to minimize hazard to motorists. Weights used to stabilize the supports shall be placed less than twelve (12) inches above the surface. For maximum mobility on certain types of maintenance operation, a larger sign may be effectively mounted on a vehicle stationed in advance of the work or moving along with it. This may be the working vehicle itself, as in the case of pavement marking equipment, or a vehicle provided expressly for this purpose. Guide signs, although ordinarily erected on separate posts, may also be mounted on or above barricades, but shall not be permitted to interfere with the effectiveness of necessary regulatory and warning signs.

REGULATORY SIGNS

B-4 Authority

Regulatory signs impose legal obligations and/or restrictions on all road users. It is mandatory that their use be authorized by the Department of Transportation or the City Council having jurisdiction and that signs conform with this Manual and the Delaware Manual on Uniform Traffic Control Devices for Streets and Highways.

B-5 Design

Regulatory signs are generally rectangular with their longer dimension vertical, and carry a Black legend and border on a White background. The Stop sign is octagonal, and has a White legend on a Red background. The Yield sign is a White inverted triangle with Red legend and border band. The Do Not Enter sign consists of a White Square on which is inscribed a Red circle with a White band horizontally across the center of the circle and the words Do Not Enter in White letters on the upper and lower parts of the circle. The One Way sign may be either horizontal or vertical plate, the latter being used more commonly in the city where space is limited. Other commonly used regulatory signs are illustrated.

B-6 Application

Construction, maintenance and utility operations represent unusual roadway conditions and warrant special attention. If construction, maintenance or utility operations require regulatory measures different from those normally in effect, the existing permanent regulatory devices shall be removed or covered and superseded by the appropriate temporary regulatory sign, taking into account applicable ordinances or statutes.

B-6A Permanent Sign

Permanent Sign are post mounted where possible. These signs are placed in the advance of the Construction or Utility area. Such as but not limited to Road Work, End Road Work, Fines Doubled in Work Zone, Road Closed, Detour, and advisory speed plate. Most of these signs are placed at the start of the project and remain in place until the project is accepted or completed.

B-6B Temporary Sign

Temporary signs are signs placed for but not limited to Closure, Flagger, Shoulder Closed, Truck Crossing, Uneven Pavement Joint, Workers, Utility Work Ahead, One Lane Road, and Blasting Zone. Temporary Signs are used in day to day operations, such as: Lane Closed, Shoulder Work, so work can be performed safely while traffic continues to flow.

B-7 Road (Street Closed Sign), Bridge, or Railroad (R11-2)

- A. Justification The Road, Bridge, or Railroad (Street) Closed sign shall be used where the roadway is closed to all traffic except contractor's equipment and officially authorized vehicles and shall be accompanied by appropriate detour signing.
- B. Placement The sign shall be erected at or near the center of the roadway on or above a Type III barricade. Red, Type B high intensity-flashing warning lights shall be mounted on and above the barricade. For daylight operations only, a flagger may be used in place of the flashing red lights.
- C. Size Because it is the last sign the driver will see before he must stop or turn, it is essential that it be large and legible. It shall have a minimum size of (48) inches by (30) inches.

SIGN SIZE	SERIES LINES		MARGIN	BORDER	DIMENSIONS							
	1	2			A	B	C	D	E	F	G	H
	48x30	D			D	1/2	3/4	48	30	5	8	4



COLOR: Black Legend and Border on White Reflectorized Background.

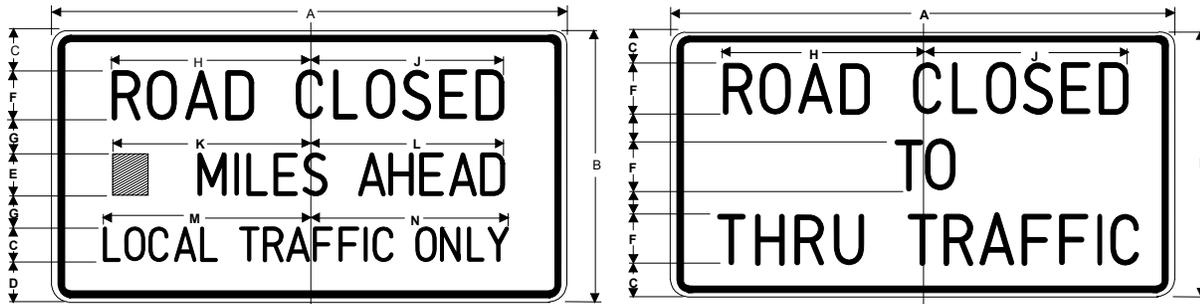
(R11-2)

The Road, Bridge, and Railroad (Street) Closed sign shall not be used where traffic is maintained or where the actual closure is some distance beyond the sign and local traffic is permitted access to nearer points. In the latter case, the Local Traffic Only sign (R11-4) or (R11-3) shall be used.

B-8 Local Traffic Only Signs (R11-3), (R11-4)

- A. **Justification** The Local Traffic Only sign shall be used where through traffic must detour to avoid a closing of the road or street some distance beyond; but where the road or street is open for traffic up to the point of closure, it shall carry the legend Road Closed XXX Miles Ahead - Local Traffic Only or, optionally for urban use, Road Closed to Thru Traffic. The words The Bridge Out shall be substituted for Road Closed where applicable.
- B. **Placement** It shall be erected on or above a Type III Barricade in the right lane of the roadway at the last intersection where traffic must detour, and shall be accompanied by appropriate detour signing. Type B flashing warning lights shall be installed on and above the barricade during all nighttime closures. (See Section D) For daylight operations only, a flagman may be used in place of the flashing lights.
- C. **Size** It shall have a minimum size of (60) inches by (30) inches.

SIGN SIZE	SERIES LINES			MAR-GIN	BOR-DER	DIMENSIONS												
	1	2	3			A	B	C	D	E	F	G	H	J	K	L	M	N
	60x30	C	C			C	1/2	3/4	60	30	4	4 1/4	5	6	3 3/8	2 15/16	22 3/8	21 3/8



(R11-3)

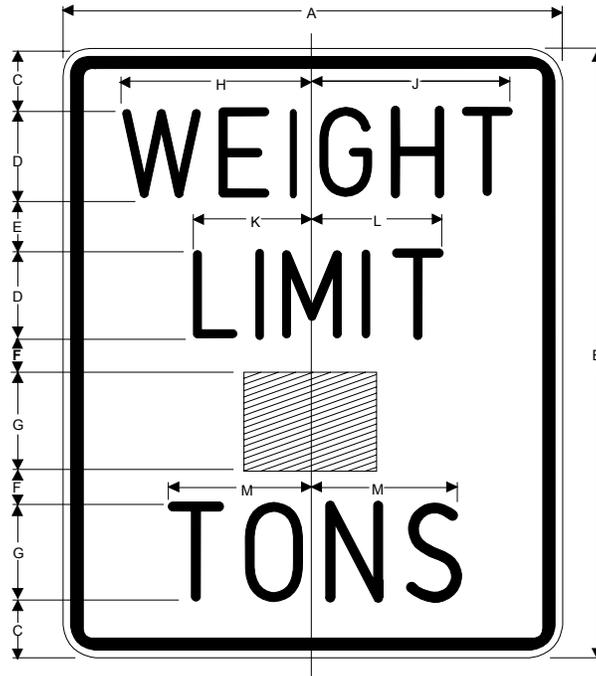
(R11-4)

COLOR: Black Legend and Border on White Reflectorized Background.

B-9 Weight Limit Signs (R-12 Series)

- A. Justification A weight limit sign shows the Gross Weight or Axle Weight that can be permitted on a roadway surface or bridge. Weight restrictions shall not be imposed without the approval of the Department. The Traffic Engineer may require a marked detour route for vehicles whose legal weight exceeds the limit posted.
- B. Placement It shall be located immediately in advance of the section of highway or the structure to which it applies. In the case of an extended length of restricted road. It should be placed on the right-hand side of the restricted roadway not more than (25) feet beyond any intersecting road on which the restriction does not apply, so as to be clearly visible from all vehicles about to enter the restricted roadway. A supplementary sign may be desirable on the left hand side of the roadway.
- C. Size It shall have a minimum size of (24) inches by (30) inches.

SIGN SIZE	SERIES LINES				MARGIN	BORDER	DIMENSIONS											
	1	2	3	4			A	B	C	D	E	F	G	H	J	K	L	M
	24x30	D	D	E			D	3/8	5/8	24	30	3 1/8	4	1 7/8	2 3/16	5	8 5/8	9 5/16
36x48	D	D	E	D	1/2	3/4	36	48	5	6	3	3 1/2	8	13	14	9 1/4	10	13 1/2

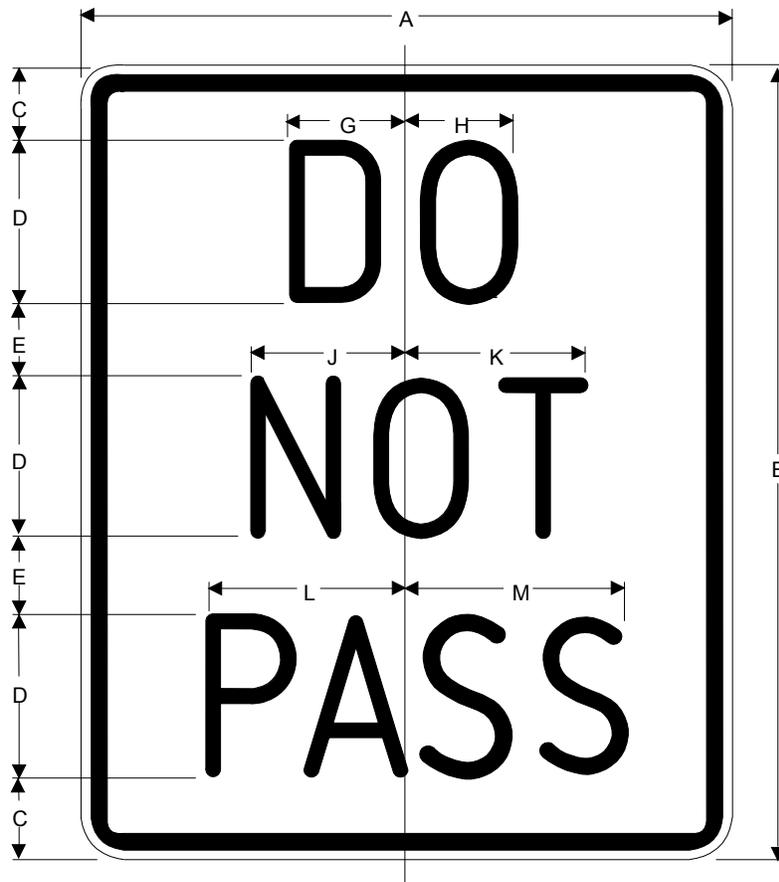


**COLOR: Black Legend and Border on White Reflectorized Background.
(R-12 SERIES)**

B-10 Do Not Pass Sign (R4-1)

- A. Placement The Do Not Pass sign may be used on a two or three lane highway at the beginning of, and at intervals within, a zone through which restricted sight distance or other condition makes overtaking and passing hazardous.
- B. Size It shall have a minimum size of (24) inches by (30) inches.

SIGN SIZE	SERIES LINES			MARGIN	BORDER	DIMENSIONS											
	1	2	3			A	B	C	D	E	F	G	H	J	K	L	M
	24x30	D	D			D	3/8	5/8	24	30	3 3/8	6	2 1/2	3 5/8	4 11/16	4 7/8	7
36x48	D	D	D	1/2	3/4	36	48	5 1/2	10	3 1/2	5 1/2	7 7/8	7 7/8	11 1/2	11 3/4	14 3/4	14 3/4



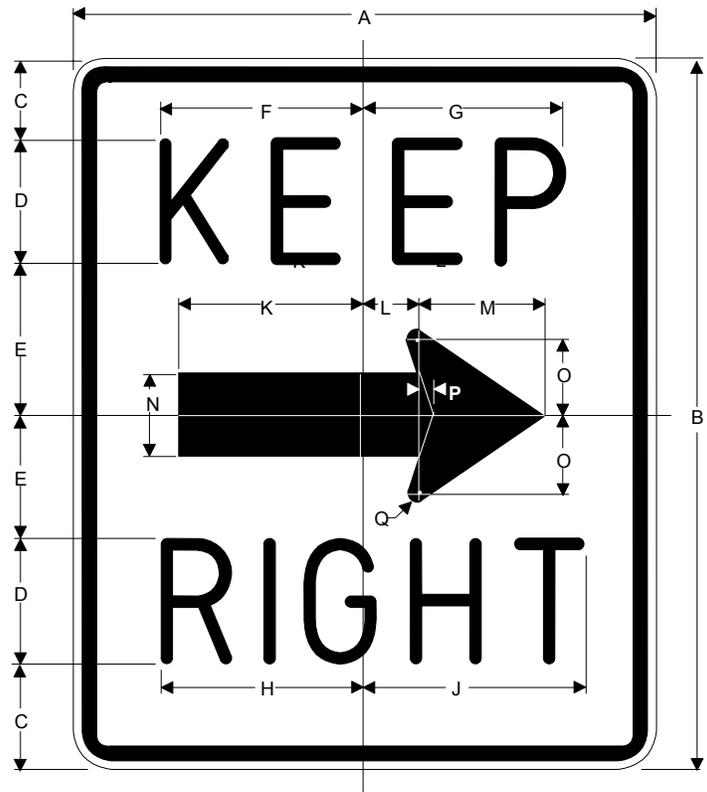
COLOR: Black Legend and Border on White ReflectORIZED Background.

(R4-1)

B-11 Keep Right Sign (R4-4R)

- A. Placement The Keep Right Sign should be used on tapers, etc., where traffic is required to keep to the right.
- B. Size It shall have a minimum size of (24) inches by (30) inches.

SIGN SIZE	SERIES		MAR-GIN	BOR-DER	DIMENSIONS															
	LINES				A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q
	1	2																		
24x30	D	D	3/8	5/8	24	30	4 1/2	5	5 1/2	8 1/16	8 3/4	7 3/16	7 1/2	7 1/8	2 1/4	5 1/4	2 1/2	3	3/8	1/2
36x48	D	D	1/2	3/4	36	48	7 1/2	8	8 1/2	12 1/2	12 1/2	11 1/2	12	12	3	9	4 1/2	5 1/4	1/2	3/4



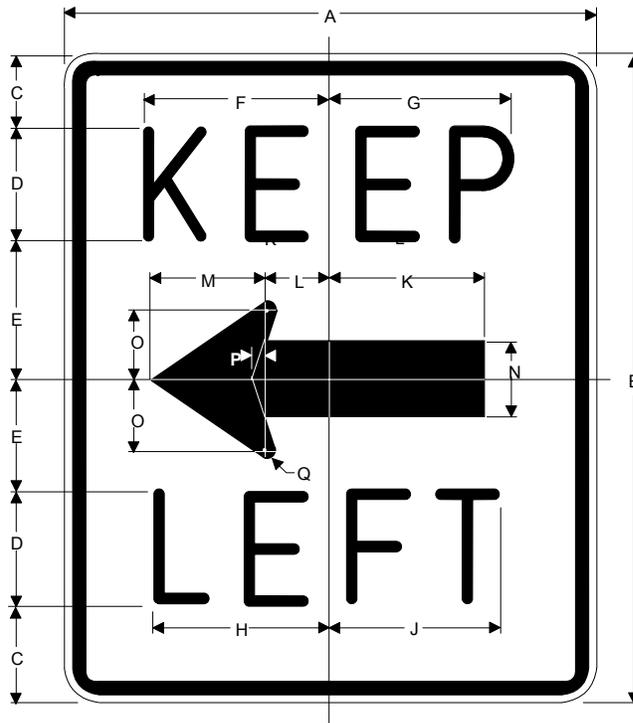
COLOR: Black Legend and Border on White Reflectorized Background.

(R4-7a)

B-12 Keep Left Sign (R4-4L)

- A. Placement The Keep Left sign should be used on tapers etc. where traffic is required to keep to the left.
- B. Size It shall have a minimum size of (24) inches by (30) inches.

SIGN SIZE	SERIES		MARGIN	BORDER	DIMENSIONS																
	LINES				A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	
	1	2																			
24x30	D	D	5/8	5/8	24	30	4 1/2	5	5 1/2	8 1/16	8 3/4	9 1/2	9 11/16	7 1/8	2 1/4	5 1/4	2 5/8	3	3/8	1/2	
36x48	D	D	1/2	3/4	36	48	7 1/2	8	6 1/2	12 1/2	12 1/2	14	14	12	3	9	4 1/2	3 1/4	1/2	3/4	



COLOR: Black Legend and Border on White Reflectorized Background.

(R4-8a)

B-13 Special Regulatory Signs

Various other regulatory signs may be called for by special operations in or around the roadway. Although it is not practicable to standardize many such signs in detail, they shall conform to the general requirements pertaining to color and shape. Their messages shall be brief, legible, and clearly understandable. Typical examples are: KEEP OFF WET PAINT; NO RADIO TRANSMISSION; and NO STOPPING.

WARNING SIGNS

B-14 Function

Warning signs are used to notify drivers of specific hazards associated with construction, maintenance or utility operations. Within the work zone there may be a variety of temporary roadway facilities. Pavement width may be reduced. Open excavations may be present in or near the roadway, or travel across an unpaved section may be required. Drivers must be properly alerted to possible dangers ahead.

B-15 Design and Application

Warning signs shall be diamond shaped (square with one diagonal vertical), having a black symbol or message and border on an orange background, except as provided for herein.

Construction, maintenance or utility operations on freeway or expressway facilities, may also require large movable warning signs. Mounting considerations for some of these signs may justify a change from the standard diamond shape to a rectangular shape, but such variances must have prior approval of the Chief Traffic Engineer.

Detailed specifications are given only for signs prescribed for construction, maintenance and utility work and for some of the standard signs that are commonly required for these work areas.

The standard size of warning signs shall be as shown with the sign illustrations herein. Where not otherwise noted, signs shall be 48 inches by 48 inches.

Where any part of the roadway is obstructed or closed, approach warning signs are required to alert traffic well in advance of these obstructions or restrictions to normal traffic flow. Because of their importance, these signs shall have a standard size of 48 inches by 48 inches, and shall be the standard diamond shape for warning signs, except as provided herein.

Where speeds and volumes are relatively low, a minimum size of 36 inches by 36 inches may be used for Approach Warning Signs, provided that a minimum letter size of 5 inches can be accommodated on this size with the appropriate legend.

B-16 Application of Construction Approach Warning Signs

The determination of the sign or signs to be used shall be on the basis of an engineering study. A set of recommended practices is included in this manual. All of these are considered typical and subject to additions or deletions as considered necessary by the engineer. As an alternate to the specific distances on the advance warning signs, the word "AHEAD" may be used when authorized by the Traffic Engineer.

TEMPORARY FLEXIBLE WARNING SIGNS

B-17 Use and Application of Temporary Flexible Warning Signs

Flexible signs, which conform to all the requirements set forth by this manual for warning signs, may be displayed in lieu of standard warning signs within construction, maintenance and utility zones under the following conditions.

It is intended that the application of all such signs be used only for temporary and/or emergency situations. Placement of temporary flexible warning signs shall not exceed a period of twenty four (24) hours in each individual instance.

B-17-A Flags

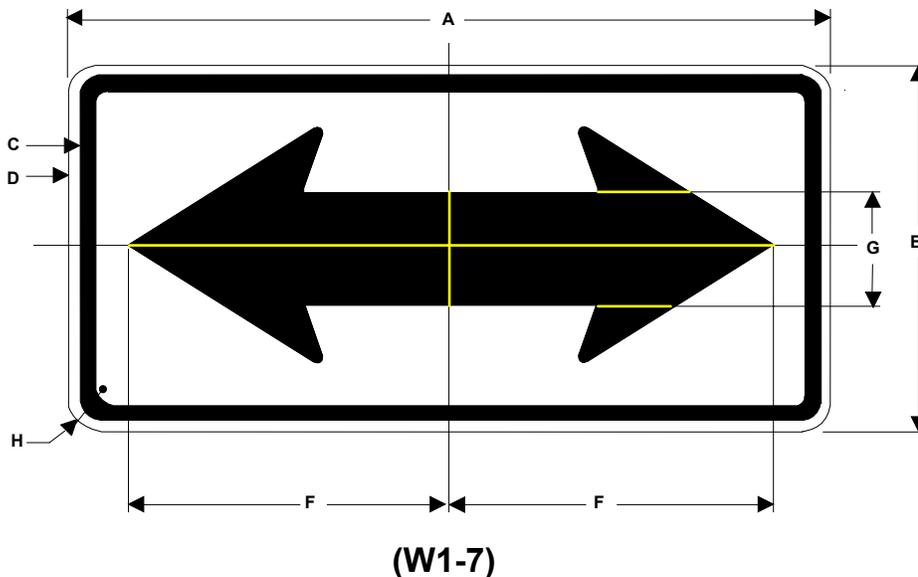
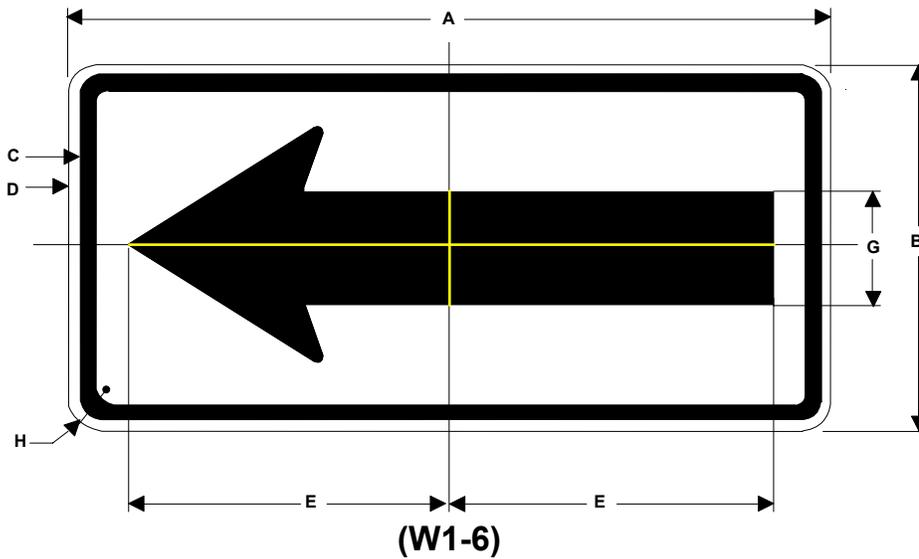
Flags used for flagging and installed on signs must be twenty-four(24) inches x twenty-four(24) inches on a three(3) foot standard, the material can be plastic or cloth; open mesh flags are not acceptable.

B-18 Large Arrow (W1-6,7)

- A. Justification The sign is intended for use where there is an abrupt change in the direction of traffic.
- B. Placement It shall be placed on the outside of a curve, on a turn, or on the far side of a "T" intersection, in line with and at a right angles to approaching traffic.
- C. Size It shall have a minimum size of (48) inches by (24) inches.

COLOR: Black legend and border on an orange reflectorized background.

SIGN	DIMENSIONS							
	A	B	C	D	E	F	G	H
STD.	48	24	1/2	3/4	19 1/2	20 1/2	6 1/2	1 7/8
SPECIAL	60	30	5/8	7/8	24 3/8	25 3/8	8	2 1/4



B-19 Advance Road or Utility Work Sign (W20-1)(-)

A. Justification

The advance work sign shall be used in advance as a general warning of obstructions or restrictions a driver may encounter. It carries the legend Road or Utility Work_____.
The word UTILITY may replace the word ROAD when pertaining to utility operations.

B. Placement

It may be used in repetition with appropriate legends or in conjunction with other construction signs. Distances shall be adjusted to the prevailing speed and traffic volume on the approaching roadway.

C. Size

It shall have a minimum size of (48) inches, by (48)inches, except as provided for herein (Section B).

B-20 Advance Detour Sign (W20-2)(-)

A. Justification

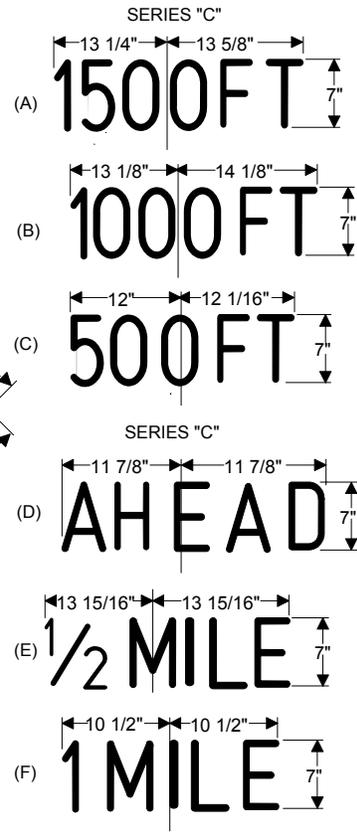
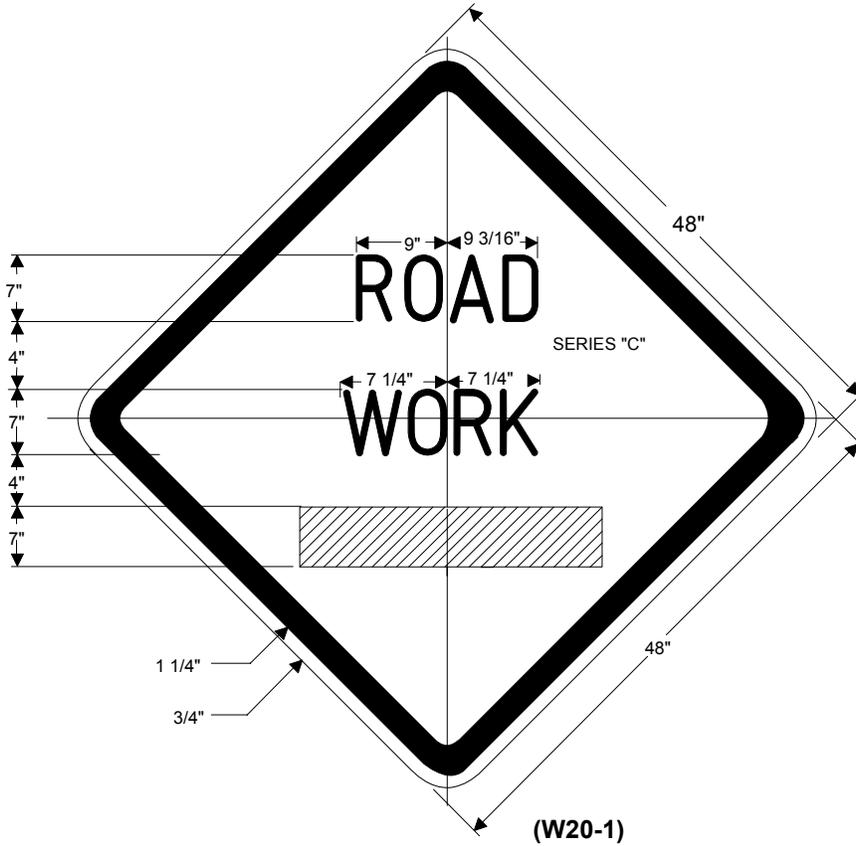
The advance detour sign shall be used in advance of a point at which traffic is diverted over a temporary roadway or route. It carries the legend Detour_____.

B. Placement

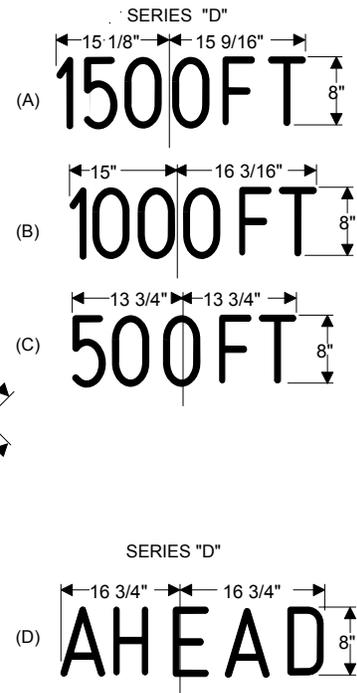
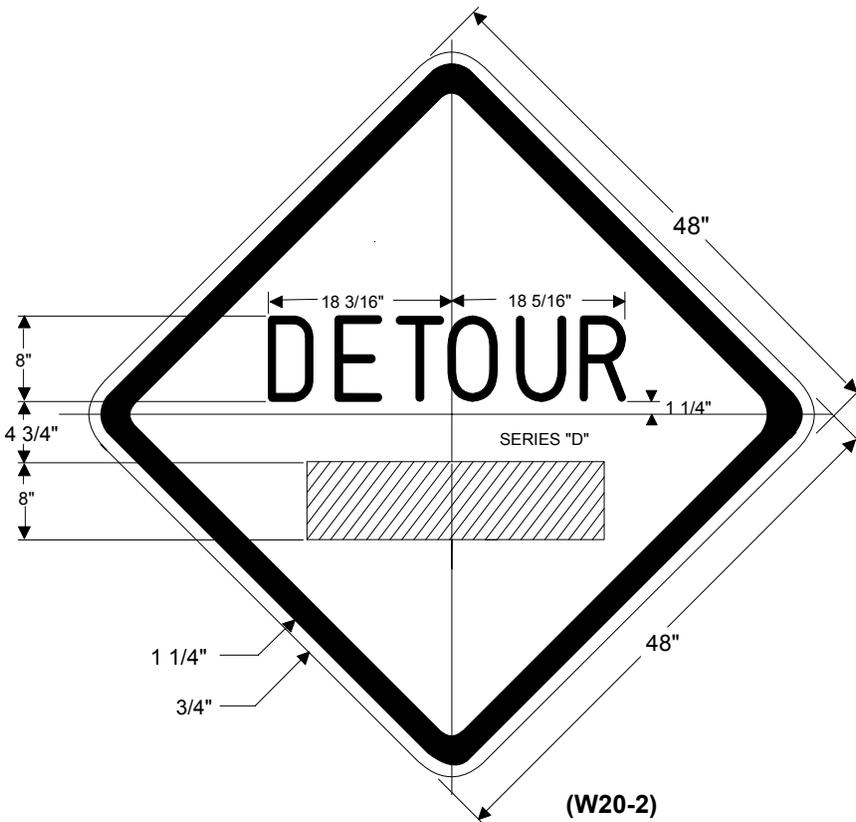
It may be used in repetition with appropriate legends or in conjunction with other construction signs. Distances shall be adjusted to the prevailing speed and traffic volume on the approaching roadway.

C. Size

It shall have a minimum size of (48) inches by (48) inches, except as provided for herein (Section B).



COLOR: Black legend and border on an orange reflectorized background.



B-21 Advance Road Closed Sign (W20-3)(-)

A. Justification

The advance road closed sign shall be used in advance of a point at which a roadway is closed to all but local traffic. It carries the legend Road Closed_____.

B. Placement

It may be used in repetition with appropriate legends or in conjunction with other construction signs. Distances shall be adjusted to the prevailing speed and traffic volume on the approaching roadway.

C. Size

It shall have a minimum size of (48) inches by (48) inches, except as provided for herein (Section B).

B-22 Advance One Lane Road Sign (W20-4)(-)

A. Justification

The advance one lane road sign shall be used in advance of a point where traffic in both directions must be a single lane. It carries the legend One Lane Road _____.

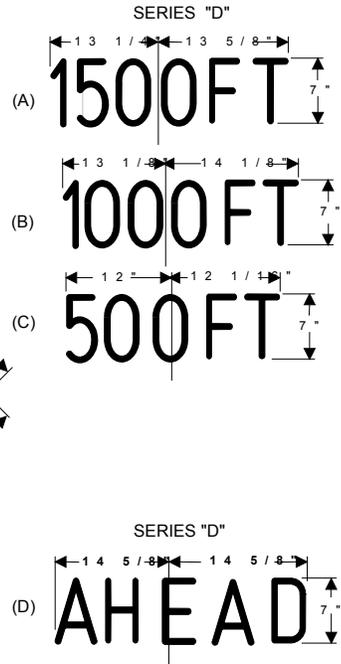
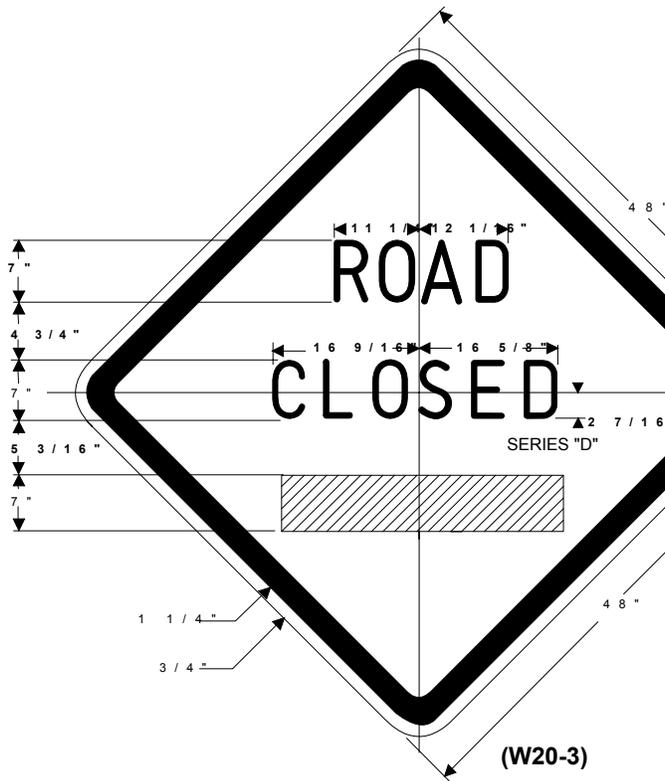
B. Placement

It may be used in repetition with appropriate legends or in conjunction with other construction signs. Distances shall be adjusted to the prevailing speed and traffic volume on the approaching roadway.

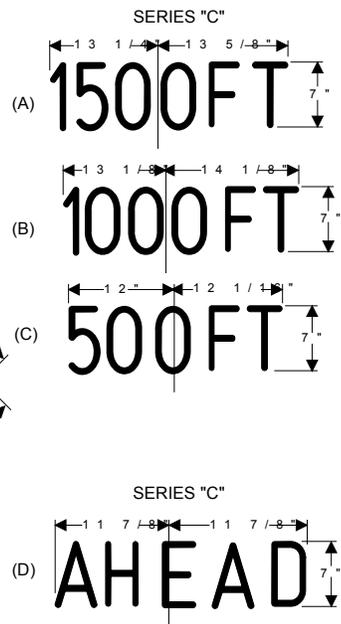
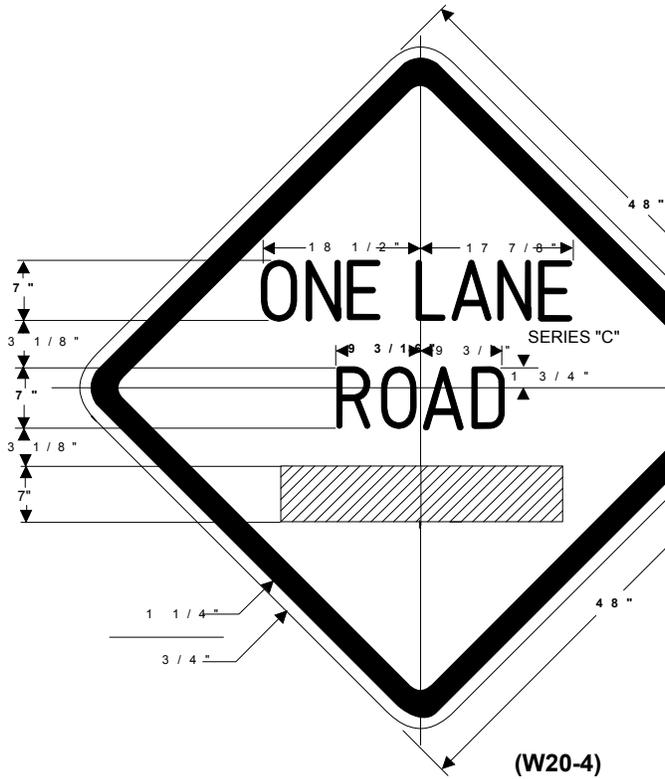
If the one-lane stretch is of such length as not to be visible throughout from either end, or if the traffic is of such volume that simultaneous arrivals at both ends occur frequently, provision must be made to permit traffic to move under additional control.

C. Size

It shall have a minimum size of (48) inches, by (48) inches, except as provided for herein (Section B).



COLOR: Black legend and border on an orange reflectorized background.



B-23 Advance Lane Closed Sign (W20-5)(-)

A. Justification

The advance lane closed sign shall be used in advance of a point where one lane of a multiple-lane roadway is closed. It carries the legend Right (Left, Center, or This) Lane Closed_____.

B. Placement

It may be used in repetition with appropriate legends or in conjunction with other construction signs. Distances shall be adjusted to the prevailing speed and traffic volume on the approaching roadway.

C. Size

It shall have minimum size of (48) inches by (48) inches, except as provided for herein (Section B).

B-24 Advance Merge Sign (W20-6)(-)

A. Justification

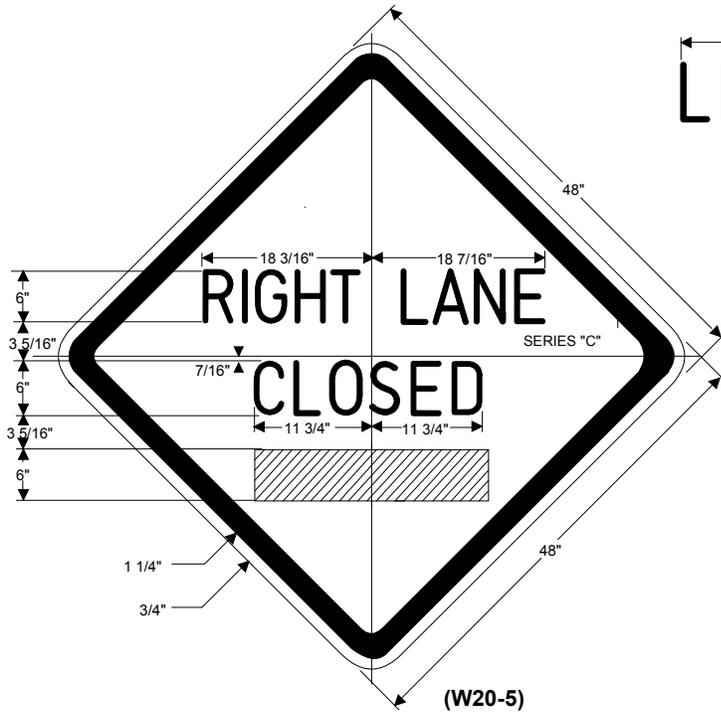
The advance merge sign shall be used in advance of a point where traffic must change lanes. It carries the legend Merge Right (or Left)_____.

B. Placement

It may be used in repetition with appropriate legends or in conjunction with other construction signs. Distances shall be adjusted to prevailing speed and traffic volume on the approaching roadway.

C. Size

It shall have a minimum size of (48) inches by (48) inches, except as provided for herein (Section B).



17 1/8" 17 1/8" 6"
LEFT LANE

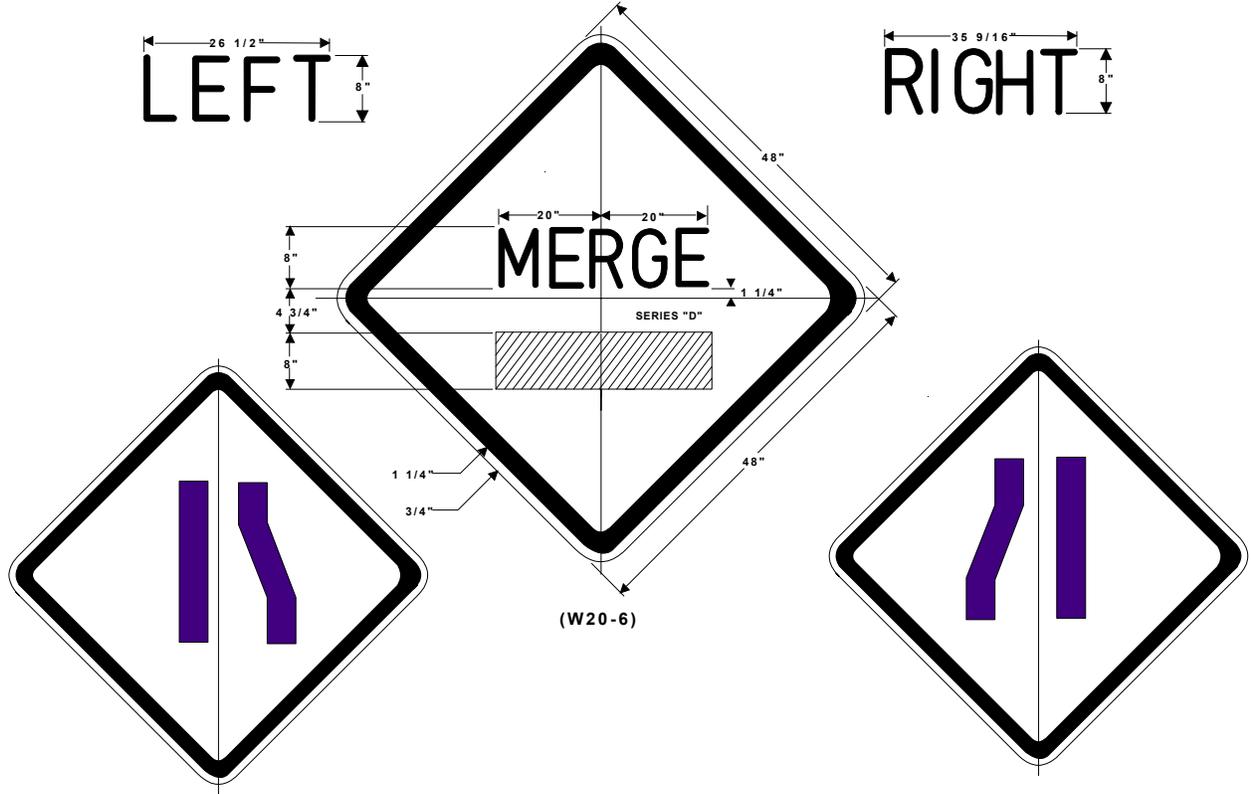
SERIES "C"
 11 3/8" 11 11/16" 6"
 (A) **1500 FT**

11 1/4" 12 1/8" 6"
 (B) **1000 FT**

10 5/16" 10 3/8" 6"
 (C) **500 FT**

10 1/4" 10 1/4" 6"
 (D) **AHEAD**

COLOR: Black legend and border on an orange reflectorized background.



26 1/2" 8"
LEFT

35 9/16" 8"
RIGHT

B-25 Advance Flagger Sign (W20-7)(-)

A. Justification

The advance flagger sign shall be used in advance of any point at which a flagger has been stationed to control traffic through a construction, maintenance or utility project. It carries the legend Flagger _____.

B. Placement

It shall be used in repetition with appropriate legends or in conjunction with other construction signs. Distances shall be adjusted to the prevailing speed and traffic volume on the approaching roadway.

The sign shall be promptly removed, covered, or turned to face away from the roadway whenever the flagger is not at his station.

C. Size

It shall have a minimum size of (48) inches by (48) inches, except as provided for herein.

B-26 The Two-Way Traffic Sign (W6-3)

A. Justification

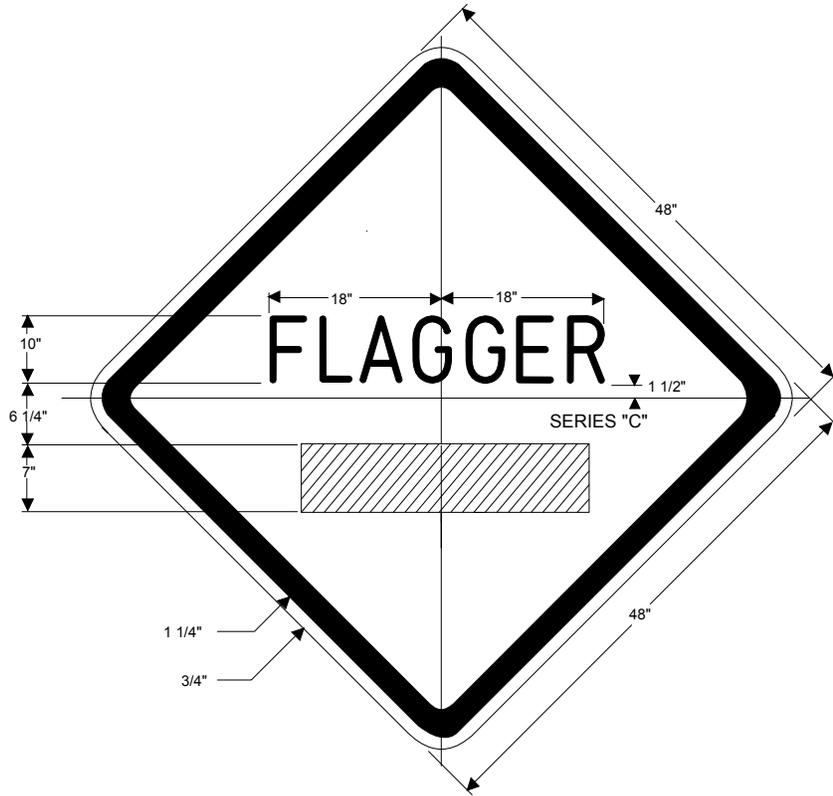
The two-way traffic sign shall be used at the beginning of two-way sections of normally divided highways and as needed at intervals to periodically remind drivers that they are on a two-way highway which contains opposing traffic. These signs shall not be used on normal two-way highways.

B. Placement

It may be used in repetition with appropriate legends or in conjunction with other construction signs. Spacing shall be adjusted to the prevailing speed and traffic volumes on the roadway.

C. Size

It shall have a minimum size of (48) inches by (48) inches and (24) inches by (18) inches except as provided for herein (Section B).



(A) 1500 FT

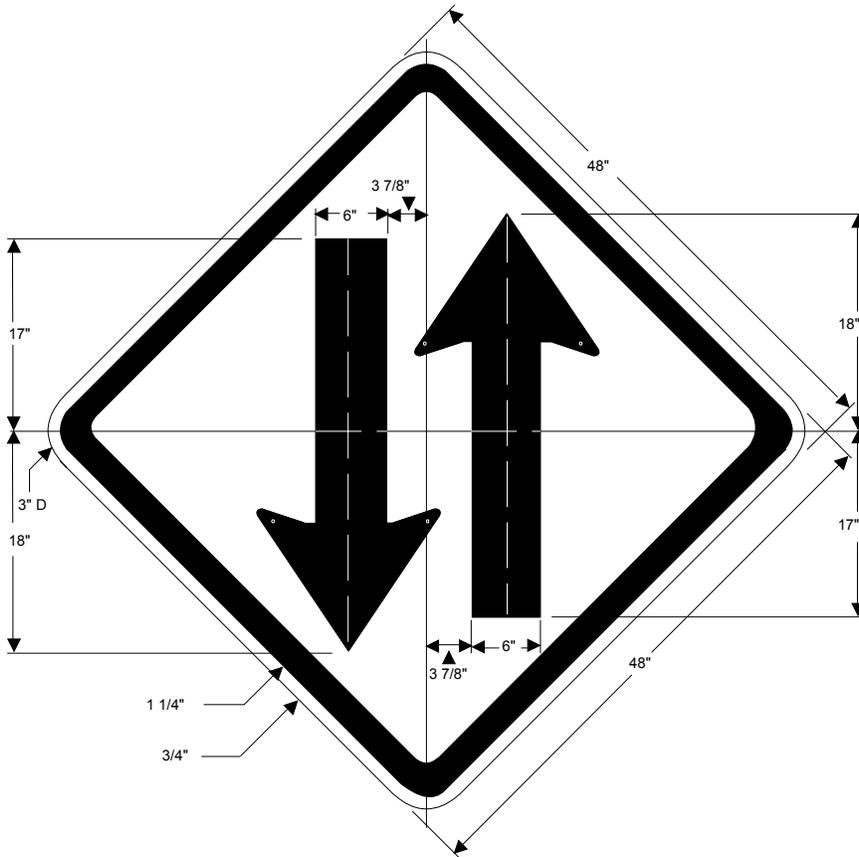
(B) 1000 FT

(C) 500 FT

(D) AHEAD

(W20-7)

COLOR: Black legend and border on an orange reflectorized background.



(W6-3)



B-27 Workers Sign (W21-1)

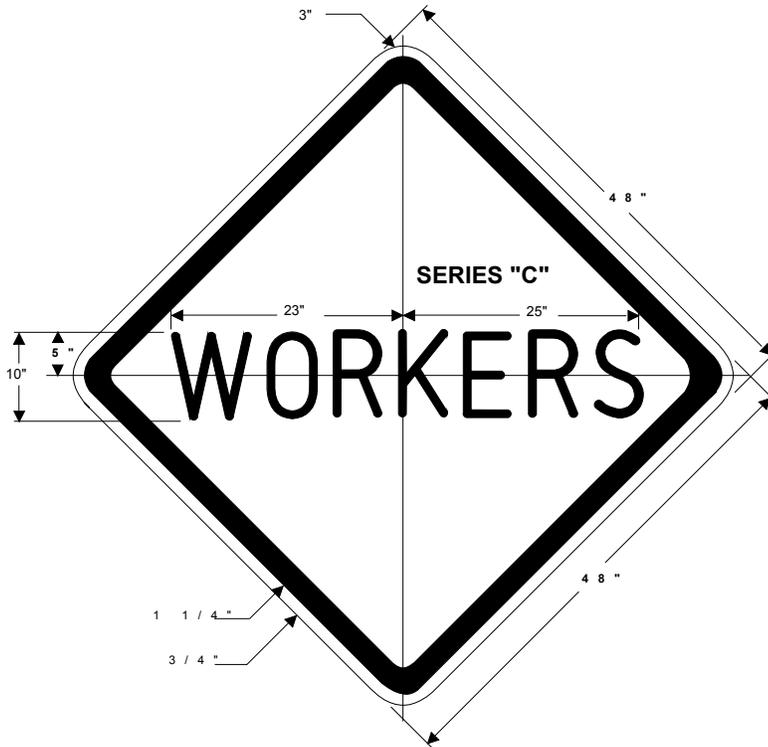
The Workers sign is intended for use in conjunction with minor maintenance and public utility operations for the protection of men working in or near the roadway. Workers signs will be used with other appropriate warning signs. On low-speed urban areas, the Workers sign is intended for use at limited obstruction sites which are adequately marked and clearly visible, such as an open manhole with a fence around it. It shall have a minimum size of (48) inches by (48) inches.

B-28 Fresh Oil Sign (W21-2)

The Fresh Oil or (Fresh Tar) sign is intended for use to warn motorists that resurfacing operations have rendered the surface of the pavement temporarily hazardous and that objectionable splashing on vehicles may occur. It shall have a minimum size of (30) inches by (30) inches.

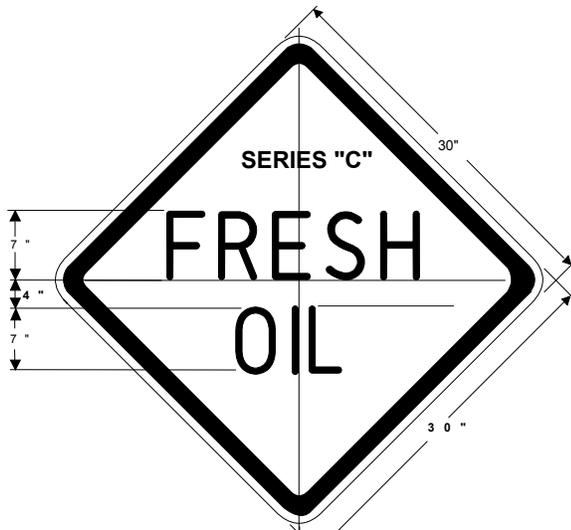
B-29 Road Machinery Sign (W21-3)

The Road Machinery sign is intended for use in areas where heavy equipment is operating in or closely adjacent to the roadway. It shall have a minimum size of (36) inches by (36) inches.



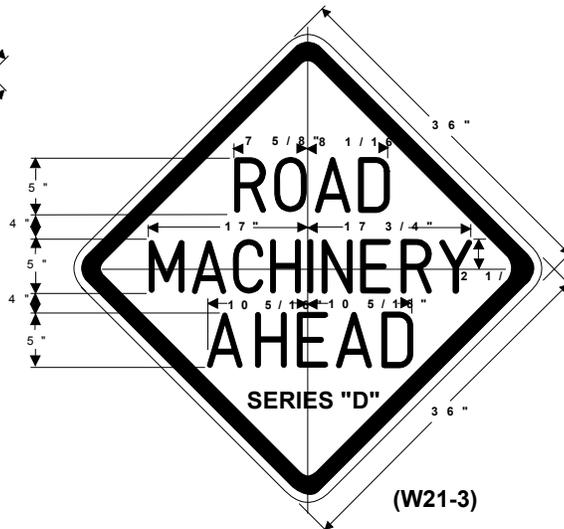
(W21-1)

COLOR: Black legend and border on an orange reflectorized background.



TAR

(W21-2)



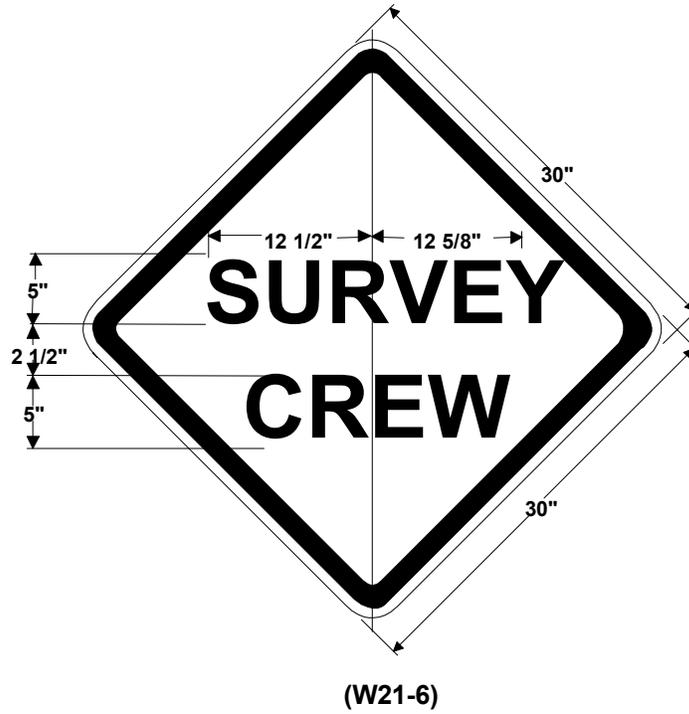
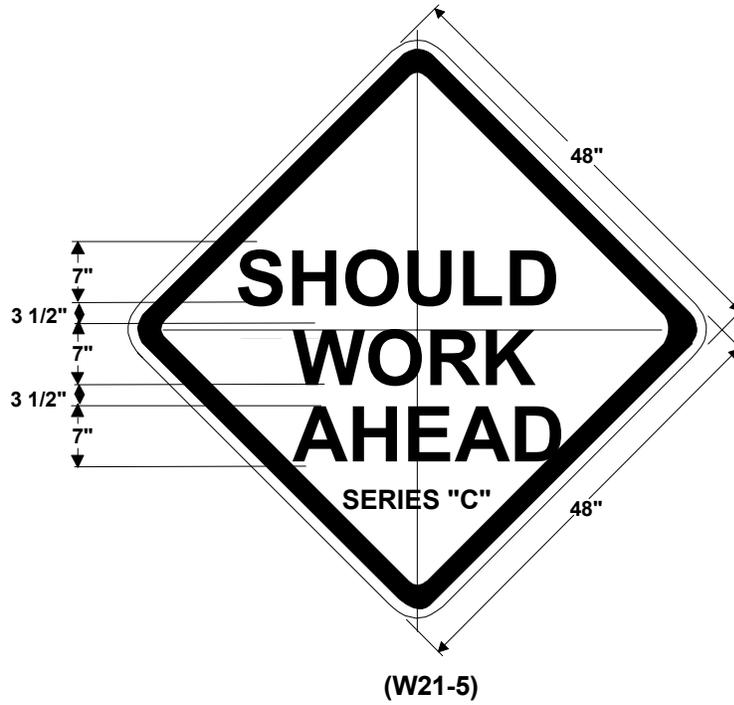
(W21-3)

B-31 Shoulder Work Ahead Sign (W21-5)

The Shoulder Work sign is intended for use in advance of maintenance or minor reconstruction operations involving the shoulder, where the traveled way remains unobstructed. It shall have a minimum size of (48) inches by (48) inches.

B-32 Survey Crew Sign (W21-6)

The Survey Crew sign is intended for use in advance of a point where a surveying crew is working in or closely adjacent to the roadway. It shall have a minimum size of (30) inches by (30) inches.



COLOR: Black legend and border on an orange reflectorized background.

B-33 Signs for Blasting Areas

Recommended practices for application shall be obtained from the Chief Traffic Engineer.

B-34 Blasting Zone Sign (W22-1)

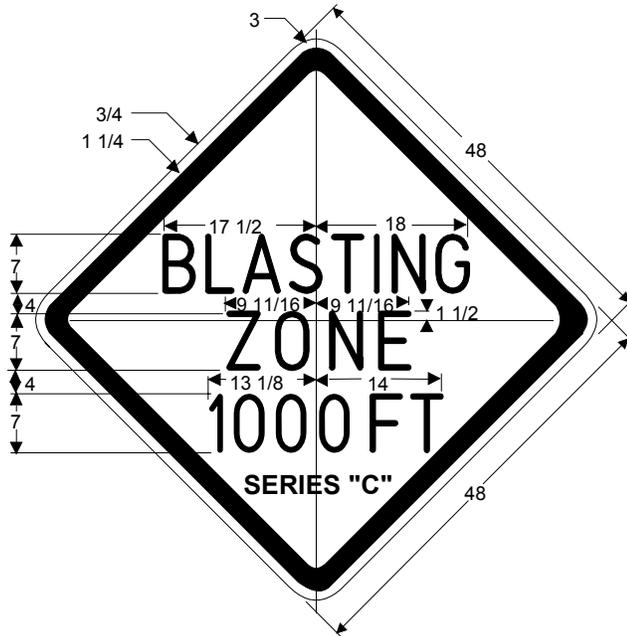
The Blasting Zone _____ ft. sign is intended for use in advance of any point or work site where there are explosives being used. The TURN OFF 2-WAY RADIO and END BLASTING ZONE signs must be used in sequence with this sign. Provision shall be made for covering or removing the sign sequence when there are no explosives in the area or the area otherwise secured.

B-35 Turn Off 2-Way Radios and Cellular Telephones Sign (W22-2)

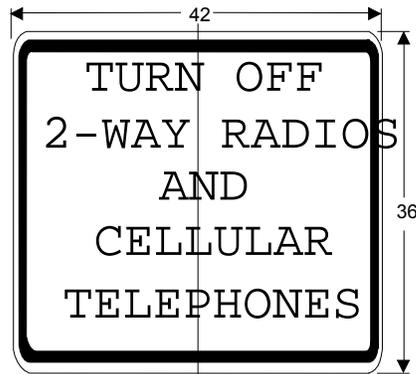
The Turn Off 2-Way Radios and Cellular Telephones sign is to be used in sequence with the BLASTING ZONE _____ FT. and END BLASTING ZONE sign and placed at least 1,000 feet from the beginning of the blasting zone. These signs shall be prominently displayed and covered or removed when there are no explosives in the area or the area otherwise secured.

B-36 End Blasting Zone Sign (W22-3)

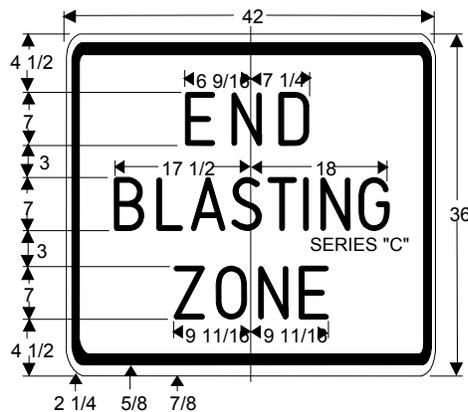
The End Blasting Zone sign is to be used to denote the end of the danger zone and shall be placed a minimum of 1,000 feet from the blasting zone, either with or preceding the END WORK sign.



COLOR: Black legend and border on an orange reflectorized background.
(W22-1)



COLOR: Black legend and border on an orange reflectorized background.
(W22-2)



COLOR: Black legend and border on an orange reflectorized background.
(W22-3)

B-37 Road Narrows Sign (W5-1)

A. Justification

This sign is intended for use in advance of a transition on two-lane roads where the pavement width is reduced abruptly to a width such that two cars cannot pass safely without reducing speed.

B. Placement

It shall be so placed that the driver will have adequate time for response.

C. Size

It shall have a minimum size of (36) inches by (36) inches.

B-38 Bump Sign (W8-1)

A. Justification

This sign is intended for use to give warning of a sharp rise in the profile of the road that is sufficiently abrupt to create a hazardous condition, to cause considerable discomfort to passengers, to cause a shifting of the cargo, or to deflect a vehicle from its true course at the posted speed limit for the road.

B. Placement

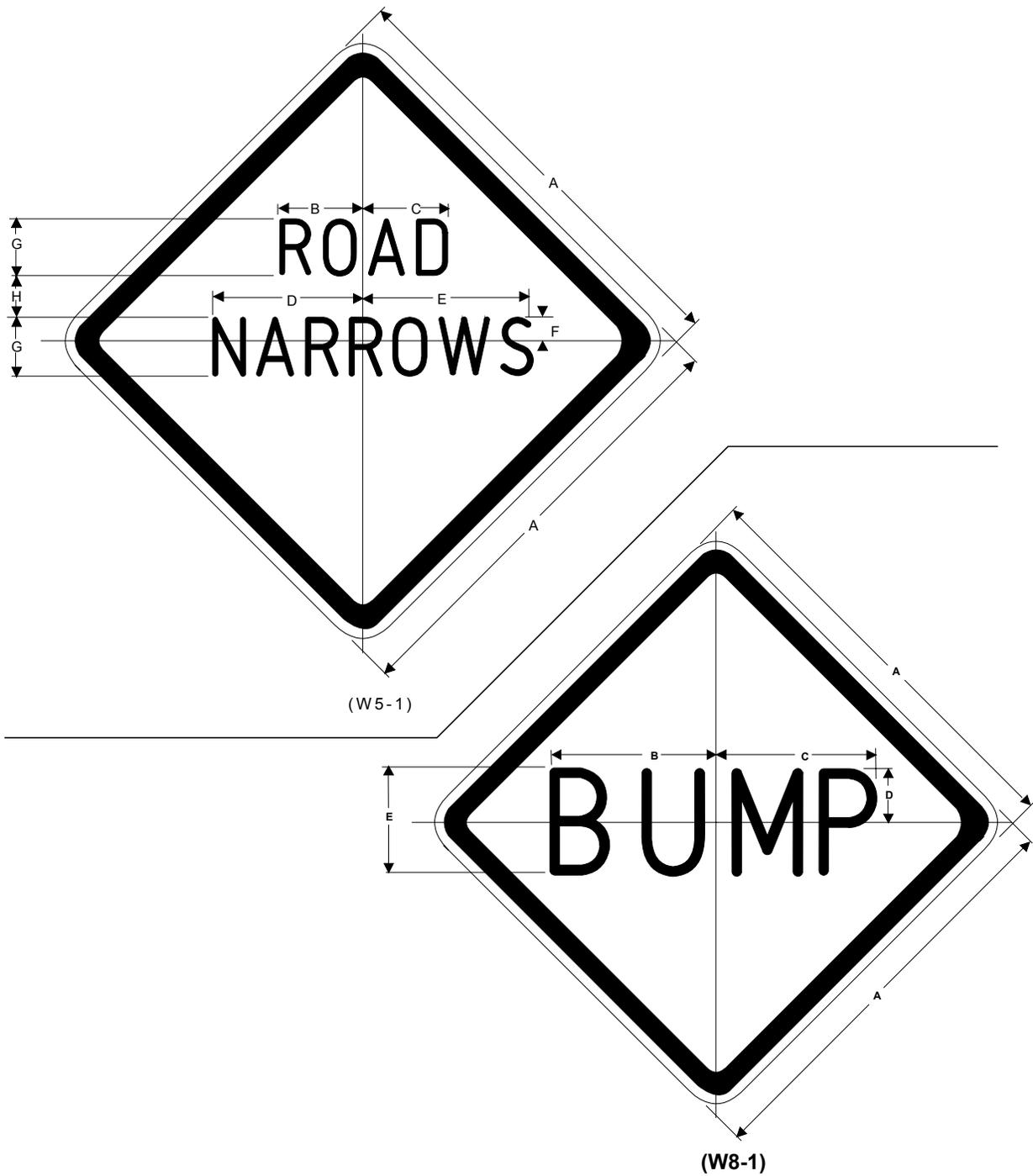
It shall be so placed that the driver will have adequate time for response.

C. Size

It shall have a minimum size of (30) inches by (30) inches.

SIGN SIZE	SERIES		MAR-GIN	BOR-DER	DIMENSIONS							
	LINES				A	B	C	D	E	F	G	H
36x36	D	D	1/2	3/4	36	7 3/4	8 1/2	14 3/8	14 11/16	1 3/4	5	3

COLOR: Black legend and border on an orange reflectorized background.



SIGN SIZE	SERIES	MAR-GIN	BOR-DER	DIMENSIONS				
	LINE			A	B	C	D	E
30x30	D	1/2	3/4	30	12 5/8	14 3/16	4	8

COLOR: Black legend and border on an orange reflectorized background.

B-39 Dip Sign (W8-2)

A. Justification

This sign is intended for use to give warning of a depression or drop in the profile of the road that is sufficiently abrupt to create a hazardous condition, to cause considerable discomfort to passengers, to cause a shifting of the cargo, or to deflect a vehicle from its true course at the posted speed limit for the road.

B. Placement

It shall be so placed that the driver will have adequate time for response.

C. Size

It shall have a minimum size of (30) inches by (30) inches.

B-40 Soft Shoulder Sign (W8-4)

A. Justification

The soft shoulder sign shall be used where a soft shoulder presents a hazard to vehicles that may get off the pavement. This sign is warranted on new shoulders and where shoulders are soft due to weather conditions.

B. Placement

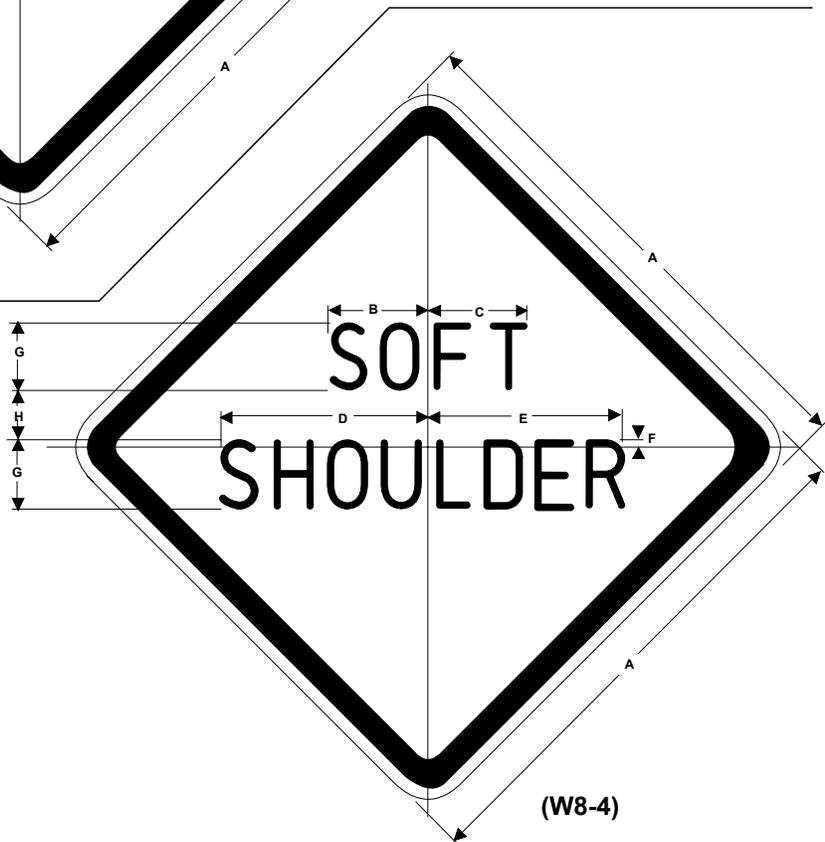
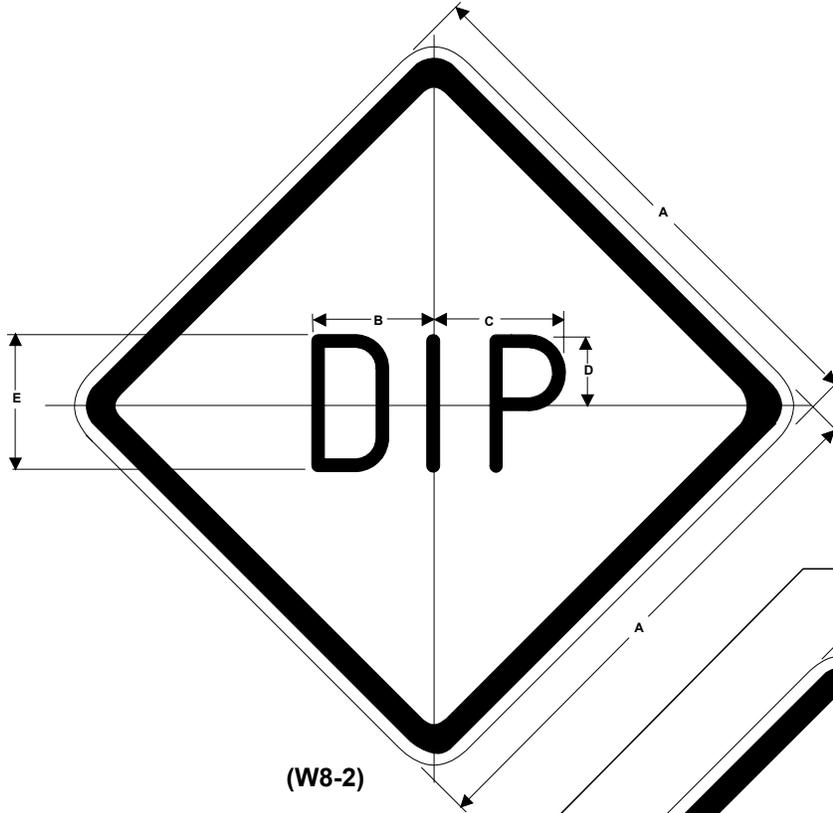
One sign shall be placed at or near the beginning of the soft shoulder condition, and other signs shall be placed at intervals throughout the length of the road where the condition exists.

C. Size

It shall have a minimum size of (30) inches by (30) inches.

COLOR: Black legend and border on an orange reflectorized background.

SIGN SIZE	SERIES		MARGIN	BORDER	DIMENSIONS				
	LINE				A	B	C	D	E
30x30	1	E	1/2	3/4	30	9 1/2	11	4	8



SIGN SIZE	SERIES		MARGIN	BORDER	DIMENSIONS							
	LINES				A	B	C	D	E	F	G	H
	1	2										
30x30	C	C	1/2	3/4	30	7	6 1/8	13 3/8	12 15/16	11/16	5	2 1/2

COLOR: Black legend and border on an orange reflectorized background.

B-41 Truck Crossing Sign (W11-1)

A. Justification

The truck crossing sign shall be used to warn motorists of hazardous crossings caused by heavy truck traffic in connection with construction, maintenance or utility operations.

B. Placement

Distance shall be adjusted to the prevailing speed and traffic volume on the approaching roadway.

C. Size

It shall have a minimum size of (30) inches by (30) inches.

B-42 Low Shoulder Sign (W8-4-1)

A. Justification

The Low Shoulder sign shall be used during resurfacing operations or whenever necessary to denote sections of the shoulder which are depressed for any reason from the pavement surface. It may also be used at any time that erosion, by any means, has caused the shoulder or adjacent material to become one(1) inch or more below the traveled portion of the roadway. (see page 52, vertical difference)

B. Placement

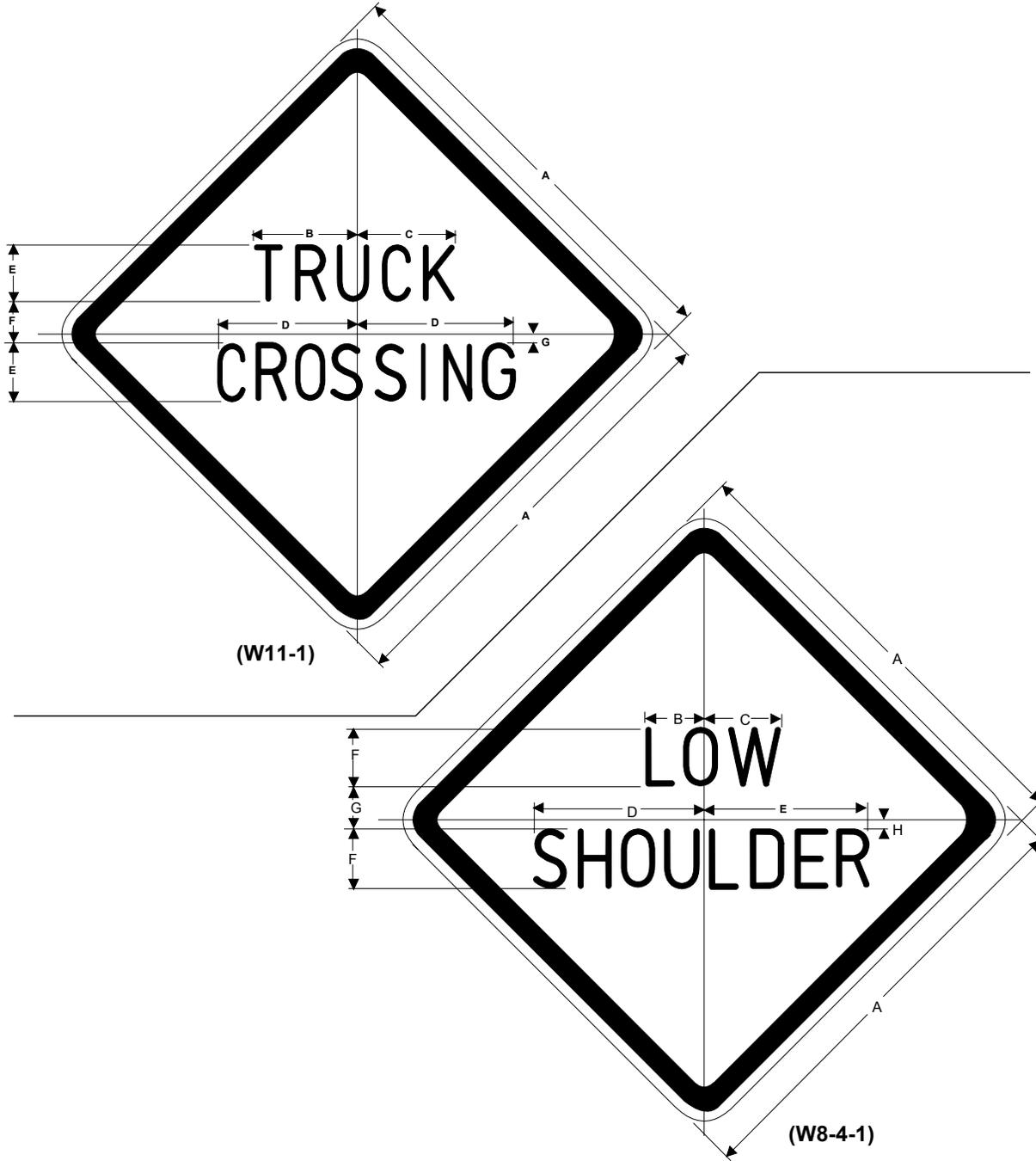
One sign shall be placed at or near the beginning of the low shoulder condition, and other signs shall be placed at intervals no greater than 2000 ft. throughout the length of the road where the condition exists. A minimum of two (2) signs shall be used.

C. Size

It shall have a minimum size of (30) inches by (30) inches.

COLOR: Black legend and border on an orange reflectorized background.

SIGN SIZE	SERIES LINES		MAR-GIN	BOR-DER	DIMENSIONS						
	1	2			A	B	C	D	E	F	G
	30x30	C			C	1/2	3/4	30	8 1/2	8 7/16	12 1/2
48x48	C	C	3/4	1 1/4	48	13 5/8	13 5/8	20	8	5 3/16	5/8



SIGN SIZE	SERIES LINES		MAR-GIN	BOR-DER	DIMENSIONS							
	1	2			A	B	C	D	E	F	G	H
	30x30	C			C	1/2	3/4	30	5	5 1/2	13 5/16	12 15/16

COLOR: Black legend and border on an orange reflectorized background.

B-43 Uneven Pavement Joints Sign (W8-9) or (W8-9a)

A. Justification

The Uneven Pavement Joints sign shall be used whenever adjacent travel lanes present, to a motorist, a vertical difference as defined in C-8 page 52.

B. Placement

The Uneven Pavement Joints sign shall be placed prior to the condition to which attention is being directed over which the condition prevails. Whenever a motorist enters the work area from an intersecting road additional signs must be placed. A minimum of two (2) signs shall be used.

C. Size

It shall have a minimum size of thirty (30) inches by (30) inches with a black legend and border on an orange reflectorized background.

B-44 Advisory Speed Plate (W13-1)

A. Justification

The Advisory Speed Plate may be used in conjunction with a warning sign to indicate a maximum recommended safe speed through the hazardous area.

Except in emergencies, an advisory speed plate shall not be erected until the recommended speed has been determined by the Traffic Engineer.

B. Placement

When used in conjunction with a warning sign, it shall be mounted below the warning sign. It shall not be used in conjunction with any sign other than a warning sign, but it may be used alone to provide speed control that can be erected and removed by a contractor when the actual work area on a large project is concentrated or moves regularly.

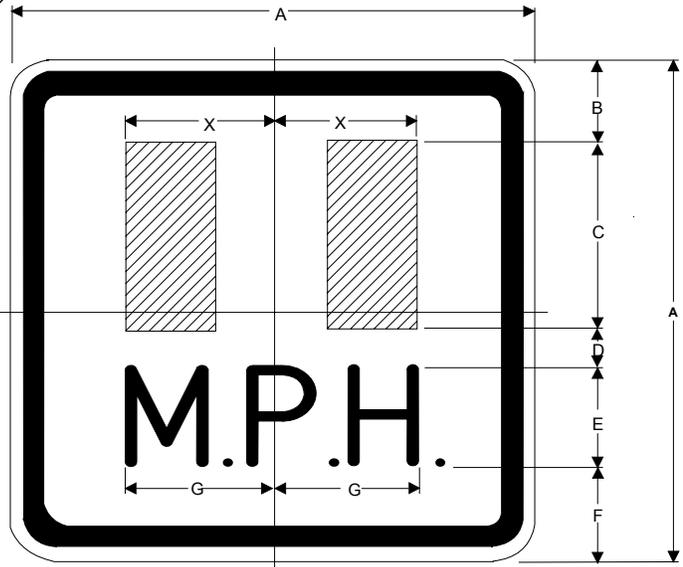
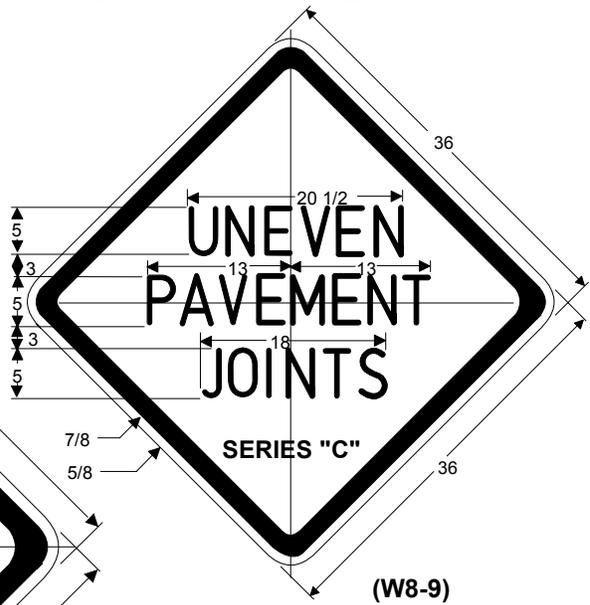
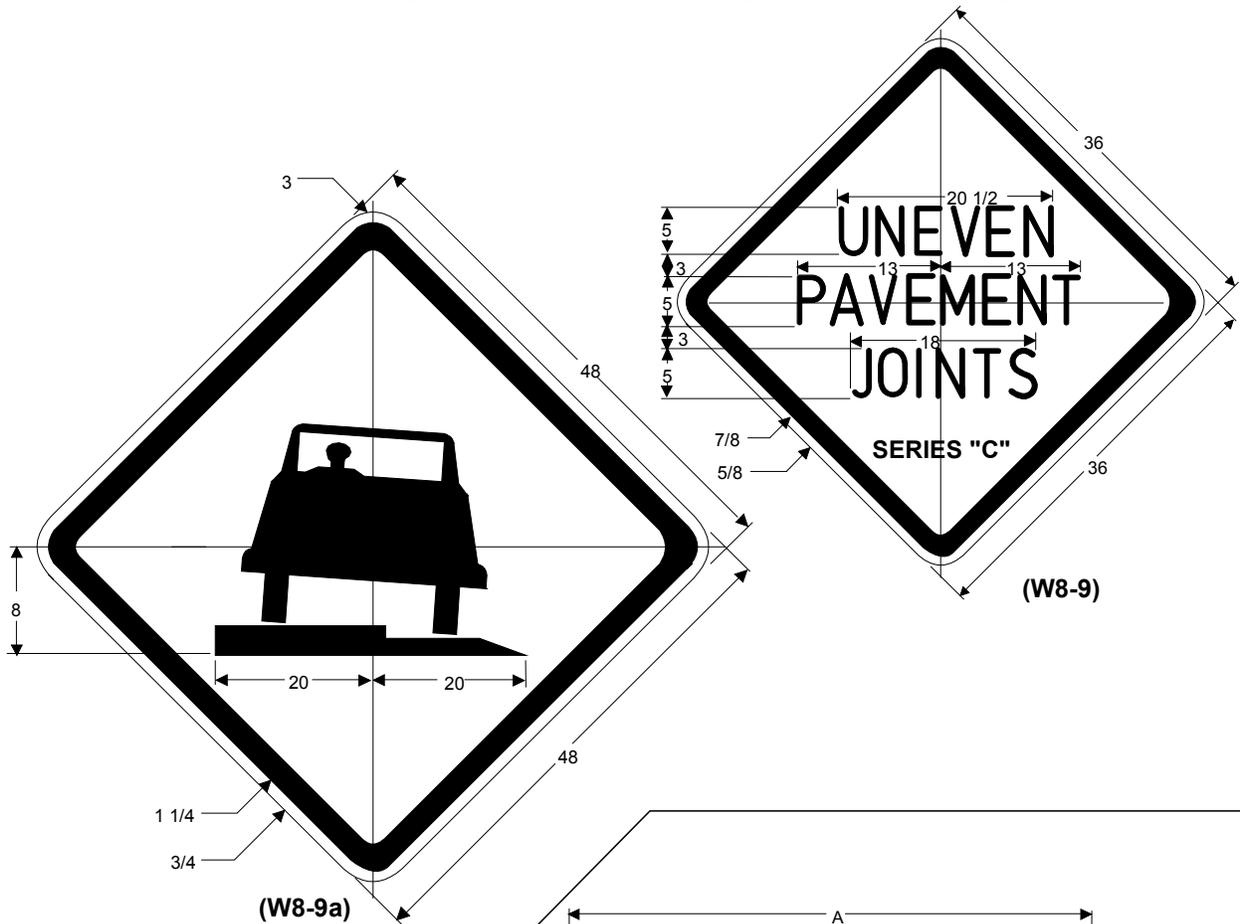
C. Size

It shall have a minimum size of (18) inches by (18) inches. The (18) inch by (18) inch size shall be used with a warning sign up to and including (36) inch signs. The (24) inch by (24) inch size shall be used with the (48) inch warning signs or when used alone.

B-45 Other Warning Signs

In addition to the warning signs specifically related to construction, maintenance or utility operations, there are numerous other warning signs, standardized for general use and treated in the Department's Manual on Uniform Traffic Control Devices, that may find application in work areas.

COLOR: Black legend and border on an orange reflectorized background.



SIGN SIZE	SERIES LINES		MAR-GIN	BOR-DER	DIMENSIONS							X						
	1	2			A	B	C	D	E	F	G	10	15	20	25	30	35	40
18x18	D	E	3/8	3/8	18	2 1/4	8	2	3	2 3/4	5 3/16	4 3/4	4 1/2	6 3/16	5 15/16	6 1/4	6 1/16	6 5/8
24x24	D	E	3/8	3/8	24	3 1/4	10	2 3/4	4	4	6 7/8	5 15/16	5 5/8	7 11/16	7 3/8	7 7/16	7 5/16	8 5/16

COLOR: Black legend and border on an orange reflectorized background.

GUIDE SIGNS

B-46 Function and Design of Information and Guide Signs

Informational signs required at construction, maintenance or utility sites include two categories:

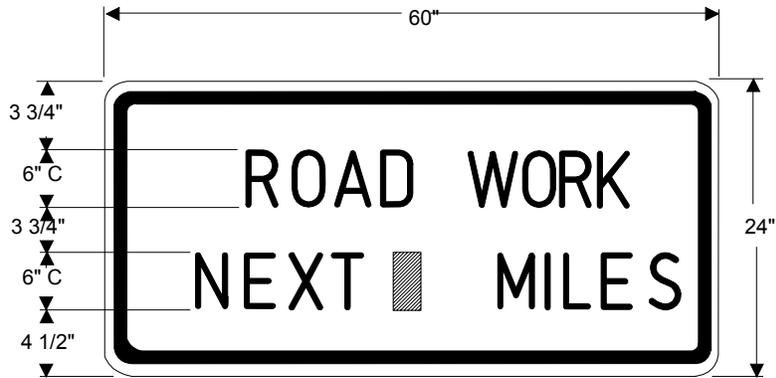
- A. Standard directional signs and route markings shall be used to the extent that temporary route changes are necessitated by road closing and detours.
- B. Special information signs relating to the work being do may be required and shall consist of a black message on a reflectorized orange background.

B-47 Length of Road Work Sign (G20-1)

- A. Justification: The length of road work sign shall be used at the limits of any road construction or maintenance job of more than two (2) miles in extent, where traffic is maintained through the job site. This sign will be used where required for jobs of lesser length on urban streets with appropriate distances shown.
- B. Placement: It shall be erected at the beginning of the job site and may be effectively mounted on a wing barricade.
- C. Size: It shall have a minimum size of (72) inches by (48) inches.
- D. Mileage: It shall be to nearest whole mile - no fractions of miles i.e. 3 miles; 5 miles, etc.

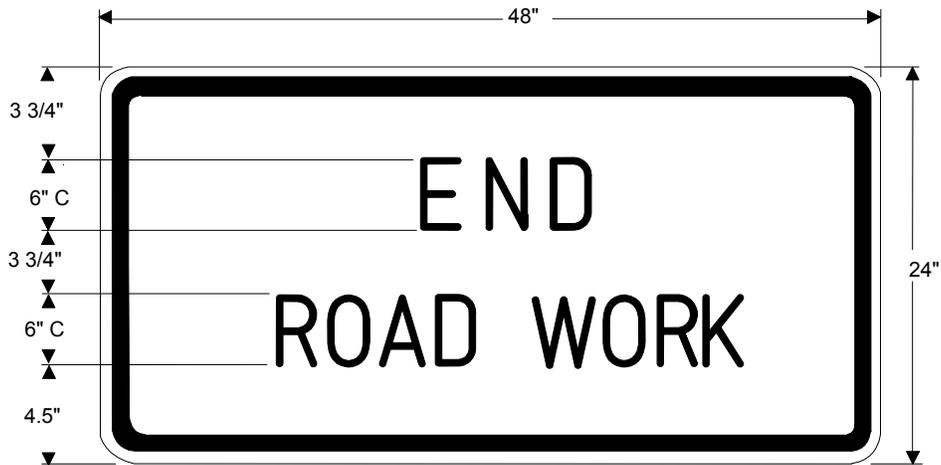
B-48 End Road Work Sign (G20-2)

- A. Justification: The End Road Work sign shall be used at the limits of a construction or maintenance job, where traffic is maintained through the job site.
- B. Placement: It shall be erected approximately 500 feet beyond the end of the job site. (10 AUG 90 - REV 1)
- C. Size: It shall have a minimum size of (48) inches by (24) inches.



(G20-1)

COLOR: Black legend and border on an orange reflectorized background.



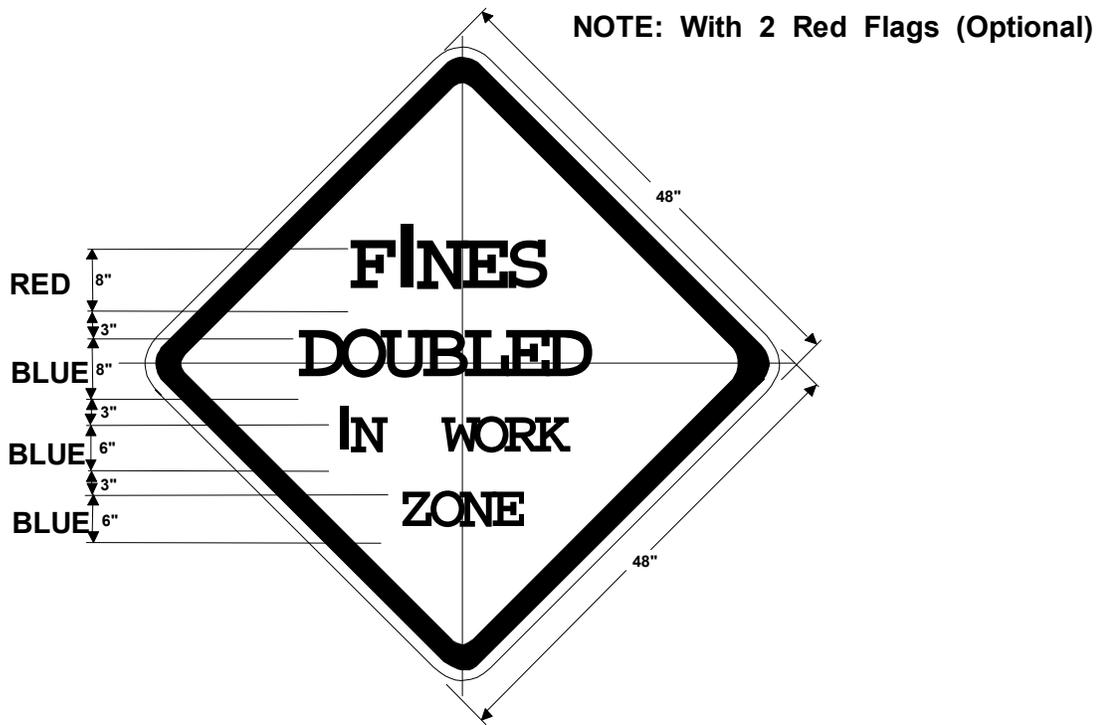
(G20-2A)

COLOR: Black legend and border on an orange reflectorized background.

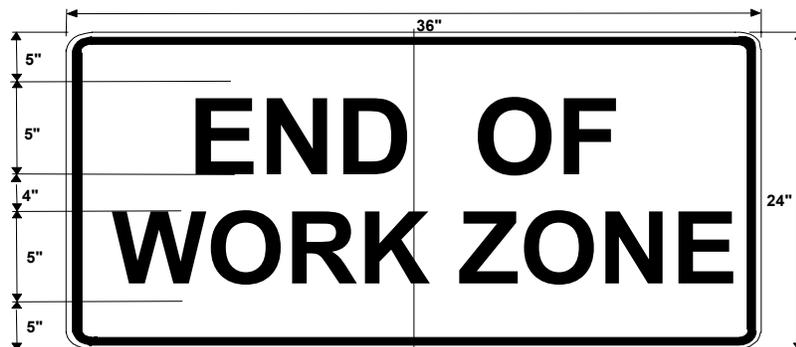
B-49 FINES DOUBLED IN WORK ZONE

Delaware Law provides for traffic violation fines to be doubled in utility, construction, and maintenance work zones. To aid in warning the motorist the “Fines Doubled in Work Zone” signs have been developed. These signs shall be used for work zones on high speed roadways. The signs may be used on other work sites as specified in plans.

- A. Justification The “FINES DOUBLED IN WORK ZONE” sign will help to ensure the safety of road, and utility, construction and maintenance personnel, as well as that of the public traveling through areas of utility, construction and maintenance work.
- B. Placement “FINES DOUBLED IN WORK ZONE” sign should be placed between 1500’ feet and 1000’ feet advanced warning sign
 “END WORK ZONE” should be placed under the “END OF ROAD WORK” sign.



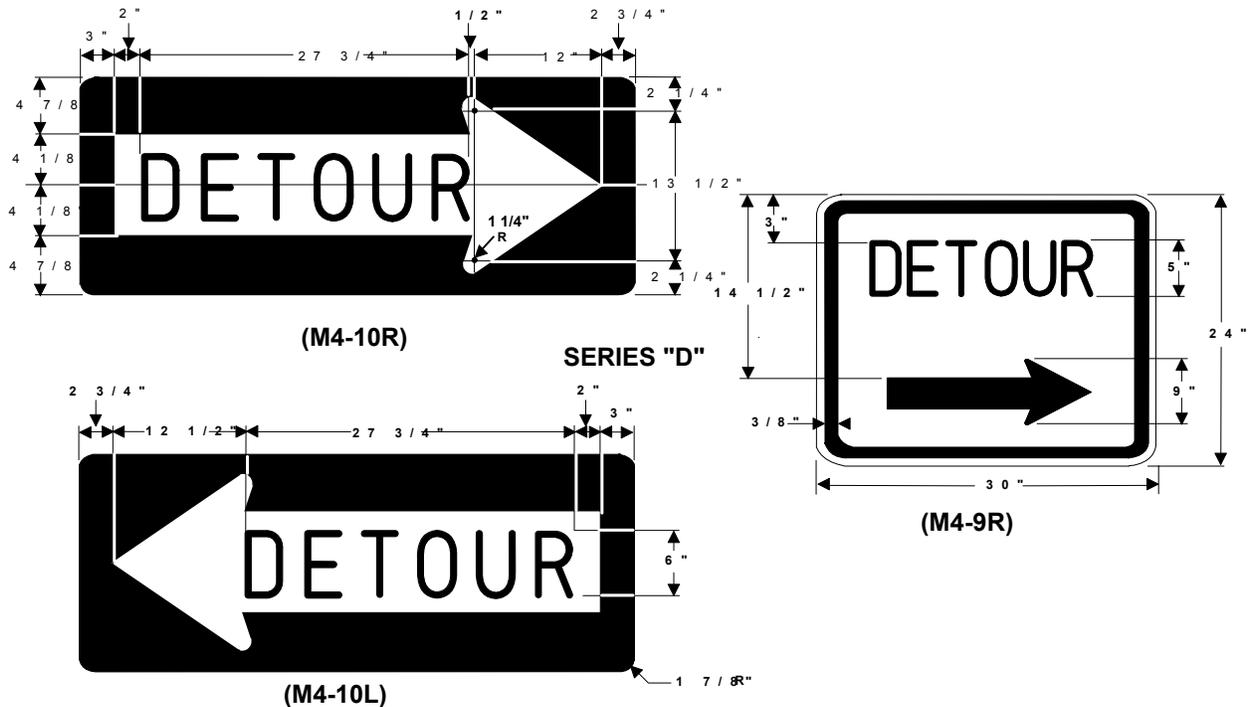
COLOR: Blue border on an white reflectorized background, FINES in red, and DOUBLED IN WORK ZONE in blue.



COLOR: Blue Legend and Border on White Reflectorized Background.

B-50 Detour Arrow Sign (M4-10), Detour Sign (M4-9)

- A. Justification: The Detour Arrow Sign (M4-10) is used when a detour roadway or route has been established due to the closure of a street or highway to through traffic.
- B. Placement: It is erected at the point of closure to through traffic. It is mounted just below the Road Closed Sign (Sec. B-8) or the Local Traffic Only Sign (Sec. B-9). The Detour Arrow Sign shall be used as a horizontal arrow point to the right or left as required at each location.
Each detour may be marked with standard temporary route markers and destination signs, as a responsibility of the Division of Highways. If an unmarked street or highway is detoured, the Detour Sign (M4-9) may be used to indicate the points at which the detour changes direction.
- C. Size: M4-9 shall have a minimum size of (30) inches by (24) inches. M4-10 shall have a minimum size of (18) inches by (18) inches.



COLOR: ReflectORIZED orange arrow with black letters and background.