Work Area Traffic Control Manual

(1993; Rev. 1999)

ARLINGTON

Work Area Traffic Control

Safeguarding workers, pedestrians and vehicular traffic is as much a part of construction and maintenance projects as the work being done.

ADOPTED BY:
ORDINANCE 93-74
ARTICLE II

City of Arlington, Texas
Public Works & Transportation Dept.
Traffic Safety Division
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SECTION I - GENERAL

1.1 PURPOSE

A. The purpose of work area traffic control is two-fold. First, it provides safe and effective movement of vehicular and pedestrian traffic through construction and maintenance areas. Second, it provides safety for the workmen performing the construction or maintenance work.. A standard method of controlling traffic in these areas minimizes confusion and delay to the public.

B. Each traffic control situation is different and, therefore, will need different controls. Through the use of illustrations and instructions provided in this manual, problem situations can be controlled and resolved.

C. Through the utilization of standard barricades, signs, signals, lighting devices, markings, channelizations, and hand signals, the traveling public and the workmen will obtain safer conditions and safety awareness.

D. In situations not covered by this manual, the protection of the traveling public and of the workmen on the site will dictate the measures to be taken.

E. All traffic control shall be in accordance with this Manual and the most recent Texas Manual on Uniform Traffic Control Devices for streets and highways. A copy of the manual is available for inspection at the Department of Transportation offices at 101 W. Abram Street, Arlington, Texas, 76010.

1.2 PLACEMENT AUTHORITY

A. Traffic control devices shall be placed only by the authority of a public body or official having jurisdiction, for the purpose of regulating, warning, or guiding traffic. No traffic control device or its support shall bear any advertising or com-

mercial message, or any other message that is not essential to traffic control.

Legal authority for the Department and local units of government to erect and maintain traffic control devices, requirement of obedience to official traffic control devices, prohibition of the display of unauthorized signs, and prohibition of interference with official traffic control devices, are found in the "Texas Uniform Act Regulating Traffic on Highways," Codified as Article 6701d, Vernon's Civil Statutes.

B. Any unauthorized sign placed on the highway right-of-way by a private organization or individual constitutes a public nuisance. All unofficial and nonessential signs should be removed and shall be removed if required by the Director of Transportation or his designee.

C. With proper authority being given, construction contractors and public utility companies are permitted to erect construction and maintenance signs at work sites to protect the public, equipment, and workmen, provided that such signs conform to the standards of the manual.

Effective traffic control depends not only on appropriate application of devices, but on reasonable enforcement of regulations as well. Standards in this manual are based on that concept.

1.3 DEFINITION OF TERMS

A. Shall – A mandatory condition. Where certain requirements in the design or application of the device are described with the "shall" stipulation, it is mandatory that these requirements be met.

B. Should – An advisory condition. Where the word "should" is used, it is considered to be advisable usage, recommended but not mandatory.

C. May – A permissive condition. No requirement for design or application is intended.

D. Contractor – A person or entity who undertakes to procure the performance of works or services, or the furnishing of goods, whether for the public or a company or an individual. This term includes, but is not limited to general contractors, prime contractors, and subcontractors.

E. TMUTCD – Texas Manual on Uniform Traffic Control Devices.

F. Person – Shall mean an individual or entity.

G. TCP – Traffic Control Plan.

SECTION II – OBTAINING APPROVAL TO WORK IN CITY STREETS

2.1 PERMIT

A. Any person desiring to cut, open close, excavate, barricade, or store construction materials on any street, alley, sidewalk, or other public right-of-way in the city for the purpose of installing or repairing any gas, water, sanitary sewer, telephone or electric lines, or for any other purpose whatsoever, shall first obtain a permit from the Director of Transportation or his designee with approval from other city Departments as required by the Director of Transportation. Application for a permit shall be made by submission of a Traffic Control Plan pursuant to Section 2.2 herein.

B. Survey crews and all others working in or adjacent to any public road shall obtain a permit.

C. A permit must be applied for not less than twenty-four (24) hours prior to the proposed activity unless an emergency exists, in which case immediate notification must be given to the Director of Transportation or his designee. In the event the emergency occurs during non-normal working hours and constitutes a complete road closure, the Police and Fire Departments must be notified. They can be reached by dialing (817) 274-4444.

D. Approval must be secured for the District 2 Office of the Texas Department of Transportation (TxDOT) before doing any construction, maintenance work, or closing any lane of traffic on a State Highway.

E. A permit is not required of the city of Arlington, Texas Utilities Electric Company, Southwestern Bell Telephone Company, Arlington Telecable, or Lone Star Gas. However, any notices to the city or submission of plans required by the franchise agreements between the city of Arlington and Texas

Utilities Company, Southwestern Bell Telephone Company, Arlington Telecable, and Lone Star Gas Company shall be required as stated in the applicable ordinance governing said franchise agreements in the Utilities and Cable Television Chapters of the city of Arlington Code. In addition, city departments and the above named franchise utilities shall give written daily notice to the Director of Transportation or his designee for work on any street within the city limits of the city of Arlington. Any subcontractors performing work for the city or the above listed utilities shall not be exempt from obtaining a permit just because they are working for the city or said utilities.

2.2 TRAFFIC CONTROL PLAN

A. A Traffic Control Plan (TCP) is a scale plat or sketch showing the work area, the space within the right-of-way required for the work, and a proposed plan for the use of barricades, signals, signs, flags, flares, and other traffic control and safety devices about the work area. The TCP may be an illustration found in the contents of this manual, a detailed drawing, or a simple hand drawn sketch; however, it shall conform to the requirements in this manual.

B. A TCP shall be submitted for approval to the Director of Transportation or his designee for any work by any contractor, survey crew, or person on, in, under, above, or about any street, alley, curb, gutter, sidewalk or any public right-of-way within the city. The TCP shall be submitted prior to and as an express condition precedent for the issuance and continuing validity of a permit, and shall be deemed a part of such permit. Any approved TCP shall be available at the job site for review at all times.

C. The city and public utilities companies franchised by the city need not file such a plan unless deemed necessary by the Director of Transportation or his designee or required by franchise agreements between the city of Arlington and the public utilities companies.

2.3 CONTINUING VALIDITY OF PERMIT

A. Prior to, or upon institution of, or during the proceeding of, or prior to completion of any work for which a permit is required as an express condition precedent to the continuing validity of said permit, all specifications of the TCP and all regulations set forth in this manual, including, but not restricted to, proper maintenance of barricades, signals, signs, or other traffic control or safety devices, must be complied with, carried out, and conformed to in their entirety. Failure to do so will render said permit null and void and of no further force or effect, as if no permit had ever been issued and granted.

2.4 TIME AND STORAGE RESTRICTIONS

A. The Director of Transportation or his designee may require that work on any street, alley, sidewalk, or other public right-of-way be done only at certain hours during the day or night. A lane of traffic shall not be closed without prior approval of the Director of Transportation or his designee for work done from 7:00 a.m. to 9:00 a.m. and from 4:00 p.m. to 6:00 p.m., on any street that is 37 ft. wide or wider, or listed on the Thoroughfare List below, or listed in Section 2.5, State Highways List, or as required by the Director of Transportation or his designee.

B. The Director of Transportation or his designee may require that materials or equipment used in work on any street, alley, sidewalk, or other public right-of-way, and the dirt and materials removed from any excavation, be located other than adjacent to the work area where feasible.

C. Thoroughfare List

Abram St.
Arbrook Blvd.
Arkansas Ln.
Avenue E East
Avenue H East
Avenue J
Ascension Blvd.
Bardin Rd.
Bowen Rd.
Bowman Rd.
Brookhollow Plaza Blvd.
Browning Dr.
Brown Blvd.
Burney Rd.
Calender Rd.
California Ln.
Carter Dr.
Center St.
Cooper St.
Collins St.
Colorado Ln.
Copeland Rd.
Davis St.
Division St.
Fielder Rd.
Forest Edge Rd.
Great SW Parkway
Green Oaks Blvd.
Harwood Rd.
Interstate 20
Interstate 30
Kelly Elliott Rd.
Kelly Perkins Rd.
Lamar Blvd.
Little Rd.
Matlock Rd.
Mayfield Rd.
Medlin Dr.
Melear Dr.
Mitchell St.
New York Ave.
Norwood Ln.
Oakwood Ln.
Park Row Dr.
Park Springs Blvd.
Pennant Dr.
Perkins Rd.
Petra Dr.
Pioneer Parkway
Pleasant Ridge Rd.
Poly Webb Rd.
Randol Mill Rd.
Road to Six Flags
Sanford St.
Sherry St.
Six Flags Dr.
Sprocket Dr.
Stadium Dr.
Sublett Rd.
Susan Dr.
Tennessee Tr.
Timberlake Dr.
Tucker Blvd.
Volunteer Dr.
Washington Dr.
Watson Rd.
Webb Britton Rd.
West St.
Westchester Dr.
Westwood Dr.
Woodland Park Blvd.
Woodside Dr.
105th St.
106th St.
109th St.

This list may be incomplete and is subject to revision at any time by the Director of Transportation or his authorized representative.

2.5 STATE HIGHWAYS LIST

A. Division Street (U.S. 180)
B. Pioneer Parkway (Spur 303)
C. Cooper Street (South of Abram) (FM-157)
D. Abram Street (Between Cooper & Collins) (FM-157)
E. Collins Street (North from Abram) (FM-157)
F. Watson Road (SH-360)
G. Interstate 20 (IH-20)
H. Interstate 30 (IH-30)
I. US 287 Freeway (US-287)

To obtain a permit to work on a State Highway, call: Texas Department of Transportation District 2 Office at (817) 282-6510.

SECTION III — CONTRACTOR RESPONSIBILITY

3.1 TRAFFIC SAFETY DEVICES

A. The contractor shall be responsible for obtaining and maintaining all barricades, signs, and traffic safety devices in conjunction with the work area. Daily inspections, cleaning, placements and replacements of damaged barricades, lights, and/or equipment shall be the responsibility of the contractor. The contractor shall designate one and only one traffic safety contact person for each project.

3.2 UNPROTECTED WORKSITE

A. A contractor shall not leave a worksite unprotected. If at any time a worksite is left unprotected, the Transportation Department, Engineering Services Department, Risk Management Department, or the Police Department may call any barricade company specializing in installing work area traffic control devices to install the devices required. The contractor shall be responsible for the cost of such traffic control devices.

3.3 DAMAGE CAUSED BY CONSTRUCTION

A. The contractor shall be responsible for any damage to any city-owned sign, traffic signal, or streetlight caused by construction. A minimum of 72 hours notice is required to be given to the Transportation Department for removal or relocation assistance. A charge may be levied by the city for any removal or relocation work.

3.4 GRAVEL OR TEMPORARY ASPHALT

A. The Director of Transportation or his designee may require gravel or temporary asphalt when necessary to provide safe right or left turn maneuvers, or adequate area to change lanes. All costs shall be borne by the contractor.

SECTION IV - RESTORATION OF SURFACES

4.1 REQUIREMENTS

When any street, alley, sidewalk, or other public right-of-way shall have been cut, opened, or excavated for the purpose of installing or repairing any gas, water, sanitary sewer, telephone or electric lines, or for any other purpose whatsoever, the person performing such work shall:

A. Backfill the excavation in compliance with the specifications therefore contained in the Standard Specifications for Street Improvements in the city of Arlington in effect at time of said excavation; and

B. Restore the surface of the condition in which it was found prior to excavation. In the event the excavation resulted in the displacement of street or sidewalk pavement or curb and gutter, the persons making said excavation shall, at the direction of the Director of Transportation or his designee, either:

1. Restore the surface in compliance with the specifications hereinabove described; or
2. Reimburse the city for its costs in the restoration of said surface.

SECTION V — TRAFFIC CONTROL DEVICES

5.1 BARRICADES AND/OR OTHER TRAFFIC CONTROL DEVICES REQUIRED

A. It shall be unlawful for any person to cut, open, close, excavate, or store construction material on any street, alley, sidewalk, or other public right-of-way in the city without the erection, installation, of barricades, warning devices, and other precautionary safety measures as provided in this manual.

5.2 CHANNELIZATION DEVICES

A. Traffic Cones

1. Traffic Cones may be the standard cone shape or tube shape. They shall be at least 18 inches in height and orange in color. Twenty-eight (28) inches should be the minimum height of cones used on freeways and other high-speed roadways, and on all facilities during hours of darkness, or whenever more conspicuous guidance is needed. Traffic cones are most effective in the daytime. However, if used at night, they shall be reflectorized. Because of their instability, traffic cones, when used, shall also be checked frequently by whoever is using or placing the cones.

2. The spacing of cones or vertical panels is the numerical equivalent in the feet of the posted MPH as presented in the following chart except as listed hereunder:

   If the posted speed is 35 MPH or less, or the block lengths are 200 ft. or less, the cone taper length may be half the normal amount. The number of devices would be the same.

CONE OR VERTICAL PANEL TAPER LENGTHS

POSTED SPEED	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH
SPACING OF DEVICES WITHIN THE TAPER	30'	35'	40'	45'	50'	55'
ONE LANE	150'	200'	275'	450'	500'	550'
TWO LANE	600'	800'	1100'	1800'	2000'	2200'
THREE LANE	1050'	1400'	1925'	3150'	3500'	3850'

B. VERTICAL PANELS:

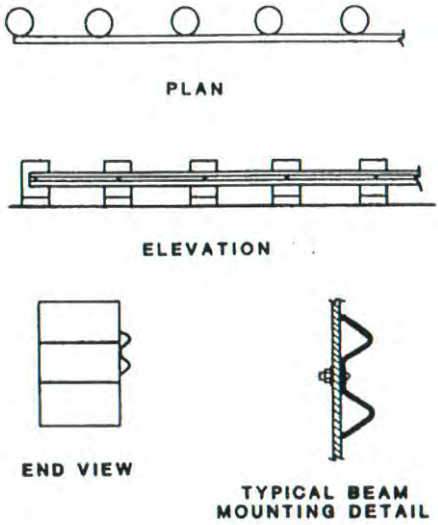
1. Vertical panels may be used in place of traffic cones when a semi-permanent installation is desired. Vertical panels shall be weighted with sandbags under windy conditions. They have a higher level of visibility in contrast to traffic cones.

2. The vertical panel shall be 8 inches to 12 inches wide and a minimum of 36 inches high. Both sides of the panel shall be covered with standard orange and white barricade reflective sheeting mounted at an angle of 45 degrees and with the top edge of a minimum of 36 inches above the pavement.

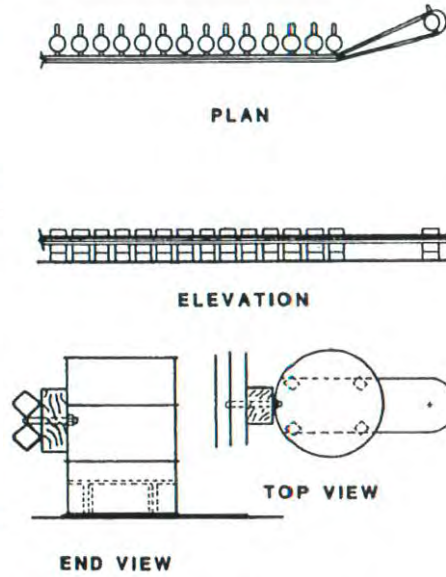
C. DRUMS:

1. Plastic: Plastic drums are designed for use whenever channelization is needed over prolonged periods. They range from 30 to 55-gallon capacity or equivalent and shall be marked with circumferential stripes 4 inches to 8 inches wide. There shall be at least 2 orange and 2 white stripes on each drum.

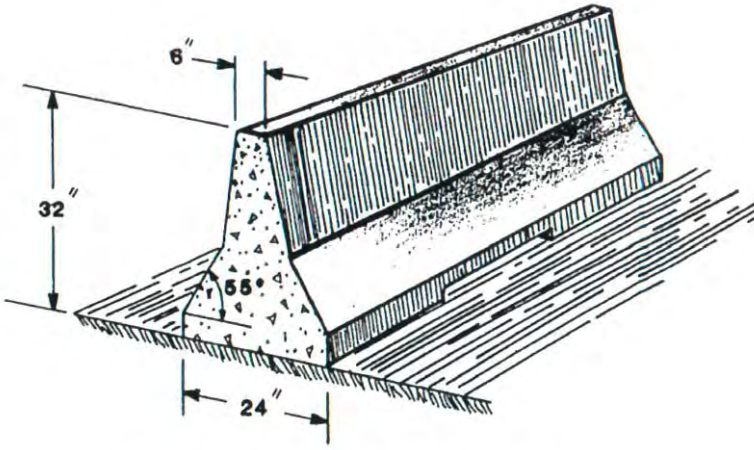
2. Metal: Metal drums may be used for sign mounts and guard-rail attachment only.



W-BEAM-ON-BARREL SYSTEM



TIMBER W-BEAM BARRIER SYSTEM



PRECAST CONCRETE SAFETY SHAPE

D. BARRICADES:

1. Barricades shall be marked with alternate orange and white stripes which slope downward at an angle of 45 degrees in the direction of passing traffic movements. Type II Barricades should not be used to channelize traffic, but may be used to outline the excavation or construction area in the street. Type III Barricades may be used to channelize traffic.

2. Barricades are also effectively used to block off a portion of the entire street. It is important that these barricades be placed no further than 5 feet apart to prevent vehicles from attempting to drive between them when an entire street is closed.

3. A barricade shall not be used as a replacement for a sign, light, cone, or flagman. A larger and heavier barricade may effectively be used to support signs. Normally, several barricades are needed to close an entire roadway.

E. PORTABLE BARRIER – DESIGN AND APPLICATION:

1. Barriers are highway appurtenances designed to prevent vehicular penetration from the travelway to areas behind the barrier so as to minimize damage to impacting vehicles and their occupants. They may also be used to separate two-way traffic.

2. Portable barriers are barriers that are capable of being moved from one site to another. These devices may be constructed of concrete, metal, or any material that will act to physically deter access of vehicles from certain portions of the right-of-way.

3. Barriers may serve an additional function of channelizing traffic; however, their use should be determined by engineering analysis and the protective requirements of the location, not the channelizing needs. When serving the additional func-

tion of channelizing traffic, portable barriers should be of light color for increased visibility. For nighttime use, barriers shall be supplemented by the use of standard delineation or channelization markings or devices.

4. Warning lights may be installed on continuous barriers. On each side of the roadway, only the first two yellow warning lights at the start of a continuous barrier may be Type "A" flashing. Subsequent warning lights on the barrier shall be Type "C" yellow steady burning for channelization. See Section 9.1 regarding warning lights.

5. The affect of impacting the ends of barriers should be mitigated. Such mitigating measures include the use of crash cushions or flaring the ends of barriers away from the travelway.

F. PAVEMENT MARKINGS:

1. At roadway work sites, it is often necessary to make temporary changes in travel paths. Often these patterns may be changed for various phases encountered in large construction projects. Only reflectorized paint, reflectorized marking tape, and/or combination non-reflective 4" pavement buttons shall be used. The Director of Transportation or his designee may require additions to or removal of pavement markings when necessary at any time during the construction project.

2. Requirements for Obliteration:

a. Be aware that when inappropriate or conflicting pavement markings remain on the roadway, motorists may be directed toward the closed portion of the highway with great danger to motorists and workmen.

The TMUTCD sets forth strict requirements for the removal of inappropriate pavement markings. It states, "Markings no

longer applicable which might create confusion in the minds of vehicle operators shall be removed or obliterated."

b. Currently acceptable methods of removing and obliterating markings include:

- Sand blasting using air or water;
- High pressure water;
- Steam or superheated water;
- Mechanical devices such as grinders, sanders, scrapers, scarifiers, and wire brushes;
- Solvent and chemicals;
- Burning;
- Overlaying with asphaltic concrete mix.

c. Actions to be taken in conjunction with pavement marking removals are as follows:

- Pavement markings shall be removed to the fullest extent possible by any method that does not materially damage the pavement;
- Markings shall be removed before making changes in traffic patterns;
- Sand or other material deposited upon the pavement as a result of removing traffic stripes shall be removed as the work progresses;
- If darkness or inclement weather interferes with removal operations, such operations shall be accomplished during the next daylight period, or as soon thereafter as weather conditions permit;
- Marking removal equipment shall be scheduled for use immediately following any change in laneage;
- The use of paint or asphaltic liquids is not allowed as a means of pavement marking obliteration.

3. Pavement Marking Applications:

a. When construction work necessitates the utilization of ve-

hicle paths other than the lanes normally used, daytime and nighttime drive-through checks should be made to evaluate the possibility that the pavement markings might inadvertently lead drivers from the intended path. Markings no longer applicable which might create confusion of vehicle operators shall be removed or obliterated as soon as practicable. Inappropriate existing pavement markings shall be removed and the new delineation placed before opening the affected lane or lanes to traffic. Traffic shifts from one path to another should not be attempted unless there is sufficient time, equipment, materials, and personnel available to properly complete it before the end of the workday.

b. The intended vehicle path shall be clearly defined during day, night, and twilight periods under both wet and dry pavement conditions.

c. Where stage construction requires changes in barricades or channelization similar day-night checks and evaluations of the existing pavement marking period should accompany each change. When a temporary roadway is constructed to bypass a closed portion of highway, appropriate reflectorized pavement markings shall be placed on the approach to, and throughout the length of hard-surfaced temporary roadways. At locations where the duration of the temporary roadway is relatively short, pavement markings consisting of reflectorized paint lines may not be practical due to the time required and expenses involved in their removal.

d. Under the above conditions, adequate short-term expendable pavement markings can be provided by the use of pressure-sensitive traffic marking tape in 1-2 foot lengths, raised pavement markers, or other suitable materials to form abbreviated pavement markings and to delineate lane continuity until such time as standard pavement markings in normal lengths can be placed. Installation shall conform to the Texas Manual on Uniform Traffic Control Devices. All temporary broken line markings shall be at least 4 feet long with a maxi-

mum gap of 36 feet. A minimum 2 foot stripe with an 18 foot maximum gap may be used in curved areas.

e. Temporary pavement markings shall be used in combination with appropriate warning signs, channelizing devices, and delineation to clearly indicate the required vehicle paths.

G. DELINEATORS:

1. Delineators are reflector units a minimum of 3" in size and are used in construction and maintenance zones to be a guide to indicate the alignment of the roadway and outline the required vehicle path. Delineators are not to be used as a warning device.

2. Delineators, when used, shall be mounted on suitable supports so that the reflecting unit is no less than 4 feet above the near roadway edge. The standard color for delineators used along the right side of streets and highways shall be white. The color of delineators used along the left edge of divided streets and highways and one-way roadways shall be yellow. Spacing along roadway curves shall be such that several delineators are always visible to the driver.

3. Delineator applications in construction areas should always be made in combination with other traffic control devices.

5.3 HIGH LEVEL FLAGS

A. High level flags are used in conjunction with advance warning signs and barricades on a telescoping stand or on a truck as an attention attracting device. Attention may be increased with optional flasher lights (day or night). The high level flags shall be mounted a minimum of 10 feet high and shall have 3 or more red flags. High level flags can be used effectively on a telescoping stand in the middle of a lane closure near the midpoint between the channelization taper and the construction site. High level flags are required for all streets

in the Thoroughfare List on page 5-7.

5.4 REFLECTIVE SHEETING REQUIREMENTS

A. High intensity sheeting shall be required for all barricades and signs. High intensity sheeting shall be the encapsulated lens type and shall meet the latest city of Arlington Specifications for High Intensity Material.

SECTION VI — TYPES OF BARRICADES

6.1 TYPE I BARRICADE (See next page)

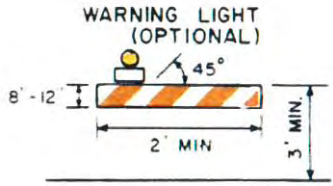
A. Type I Barricades shall be used for short duration installations whenever a high level of visibility is not necessary. Type I Barricades shall have one upper horizontal rail a minimum of 8 inches to a maximum of 12 inches wide with the top edge 36 inches to 42 inches above ground level. An optional bottom rail 6 inches wide may also be used. Type I Barricades are commonly a "horse" type that can be easily disassembled.

6.2 TYPE II BARRICADE (See next page)

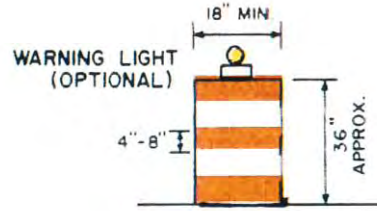
A. Type II Barricades shall be used whenever repair work is in progress. Normally they should be used only when one lane is open and one lane is closed. The Type II Barricades shall be 36 inches high and a minimum of 24 inches wide. The frame may be hinged at the top for quick installation and portability.

6.3 TYPE III BARRICADE (See next page)

A. Type III Barricades shall be used whenever closing an entire roadway, outlining the limits of the construction area, or for mounting large signs. Type III Barricades may also be used in the situations detailed in 6.1 and 6.2 above. Type III Barricades shall have three horizontal 8 inch to 12 inch wide rails spaced vertically with 20 inches center to center. The upper rail should be a minimum of 5 feet above the ground level. Type III Barricades shall be minimum of 4 feet in length and assembled in sections. The Type III Barricade is normally used when a barricade will remain in place for a long period of time or when a roadway is being totally closed.

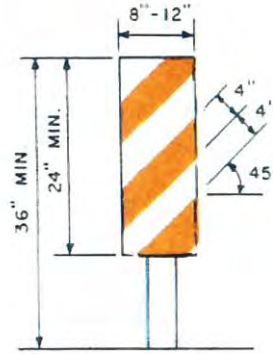


TYPE I BARRICADE

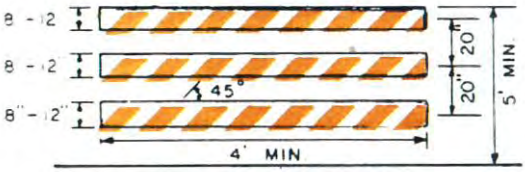


DRUM

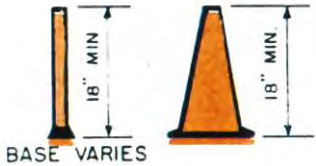
TYPE II BARRICADE



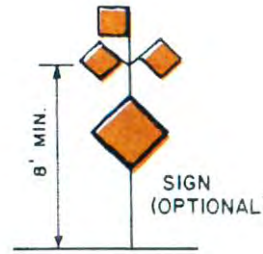
VERTICAL PANEL



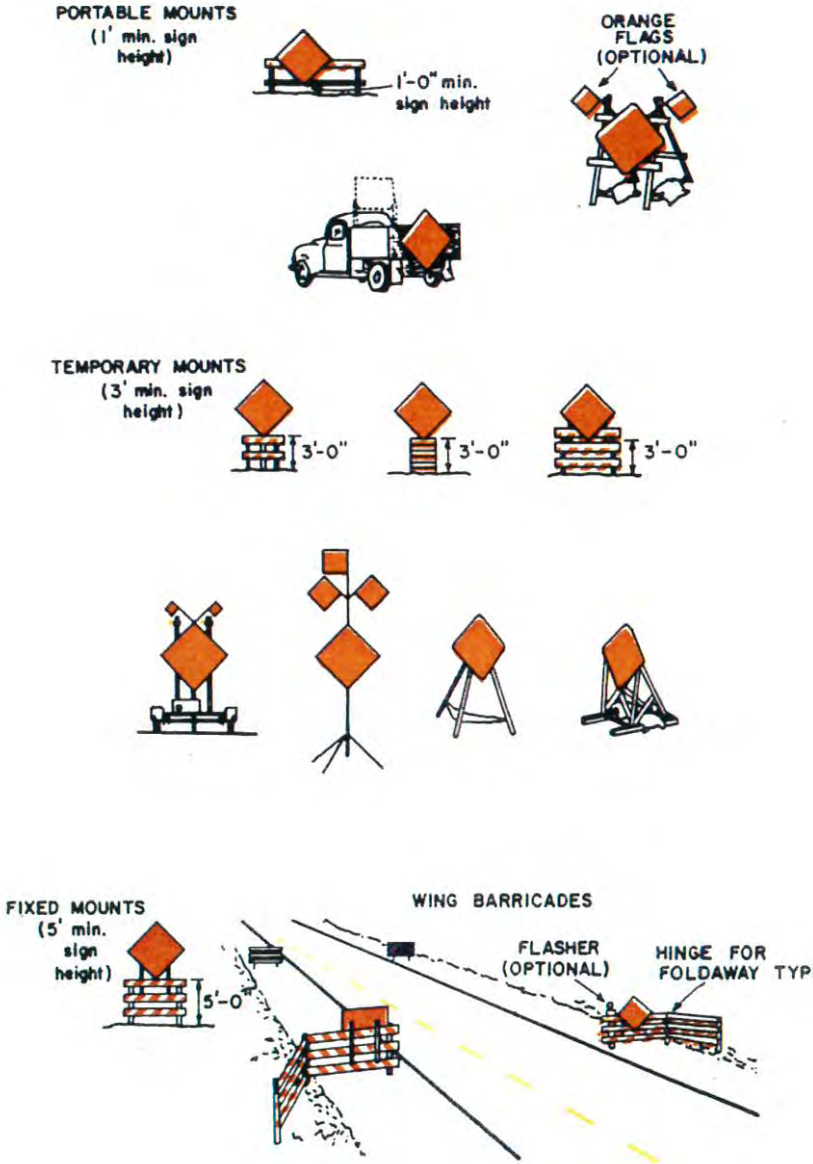
TYPE III BARRICADE



CONES



HIGH LEVEL
WARNING DEVICE


PORTABLE MOUNTS
(1' min. sign height)
1'-0" min. sign height
ORANGE FLAGS (OPTIONAL)
TEMPORARY MOUNTS
(3' min. sign height)
3'-0"
3'-0"
3'-0"
FIXED MOUNTS
(5' min. sign height)
5'-0"
WING BARRICADES
FLASHER (OPTIONAL)
HINGE FOR FOLDAWAY TYPE

6.4 BARRICADES – GENERAL

A. All three rails of Type III, two rails of Type II, and the top rail of Type I Barricades shall be marked with standard orange and white, 4 inch stripes, high-intensity reflectorized sheeting. The stripes shall be at a 45 degree angle from the vertical. The stripes shall slope downward in both directions from the center of the barricades.

B. Barricade supports shall be painted white and have the owner's name clearly imprinted in a conspicuous place. The name of the agency, contractor, or supplier shall not be shown on the face parts of any barricade. Barricades shall be kept clean at all times.

C. Type "A" or Type "C" lights can be mounted on all barricades for nighttime use. Orange flags 16 inches by 16 inches may be used on barricades during daylight hours.

SECTION VII — TYPES OF SIGNS

7.1 PURPOSES

A. Signs are very important parts of barricading and channelization. Signs shall be used as a warning device and for guiding and regulating motorists. It shall be the responsibility of the job superintendent or foreman to maintain adequate signing and to use signs as effectively as possible. The contractor or performing agency is required to use advance warnings signs in conjunction with signs at the immediate construction area. These advance warning signs give motorists a chance to prepare for the traffic control at the construction site.

B. A number of signs are illustrated on Pages 27-29. All signs and other traffic control devices shall meet or exceed those required in the Texas Manual on Uniform Traffic Control Devices. Copies of the Texas Manual may be seen at the State Department of Highways and Public Transportation and the city of Arlington's Transportation Department offices.

7.2 DESIGN OF SIGNS

A. Street or highway construction and maintenance signs fall into the same three major categories, as do other traffic signs; namely, Regulatory signs, Warning signs, and Guide signs. Many signs normally used elsewhere will also find application for signing construction and maintenance operations. Special construction and maintenance signs follow the basic standards for all highway signs as to shape. Warning signs in construction area shall have a black legend on an orange background. Existing yellow warning signs already in place within these areas may remain in use. Color for other signs shall follow the standard for all highway signs.

B. 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. However, the use of standard orange flags or yellow flashing warning lights in conjunction with signs is permitted, so long as they do not interfere with a clear view of the sign face.

C. The dimensions of 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 by the Director of Transportation or his designee. Deviations from standards sizes as prescribed herein shall be in six inch increments.

D. Standard sign sizes and colors are shown in the illustrations of the individual signs rather than in detailed specifications in the text. Where the orange background is specified and reflectorization is not required, a fluorescent material may be used for increased daytime visibility.

7.3 ILLUMINATION AND REFLECTORIZATION

A. All signs intended to be used during hours of darkness shall be either reflectorized with a material that has a smooth, sealed outer surface, or illuminated to show approximately the same shape and color day and night. Where there is serious interference from extraneous light sources and a reflectorized installation is not likely to give effective performance, an illuminated sign shall be used.

B. Sign illumination may be either internal or external. When the full face of the sign is outlined by internal illumination, thereby indicating the shape of the sign, background reflectorization is not required. Where external illumination is provided, the light source shall be properly shielded to protect drivers from glare. Street or highway lighting is not regarded as meeting the requirements for sign illumination.

7.4 POSITION OF SIGNS

A. Signs shall be located on the right-hand side of the street or roadway. Where special emphasis is deemed necessary by the Director of Transportation or his designee, the contractor, or the barricade company, dual installations may be made which consist of duplicate signs opposite each other on the left and right sides of the approach lanes, respectively. Within a construction or maintenance zone, however, it is often necessary and/or desirable to erect signs or portable supports placed within the roadway itself. It is also permissible to mount appropriate signs on barricades.

B. Signs mounted on barricades, or other portable supports may be at lower heights but the bottom of the sign shall be not less than one foot above the pavement elevation. However, higher mounting heights are desirable.

C. All warning signs installed in construction areas shall consist of black letters on an orange background. The following warning sign size and spacing table shall be utilized as prescribed, except when the posted speed is 35 MPH or less, or the block lengths are 200 feet or under. In this situation the initial warning sign placement distance may have the normal amount. Advisory speed plates shall be required for all curve or turn signs.

7.5 SIGN INSTALLATION

A. Signs for use on construction or maintenance activities are normally mounted on either portable, temporary, or fixed supports. All sign installations shall be so constructed to yield upon vehicular impact to minimize the hazard to the motorist.

B. Signs that are to remain in place for both day and night usage to regulate, warn, and guide traffic in advance of and within the limits of a construction work zone are normally erected on fixed supports. Signs erected on fixed supports shall be a minimum height of seven feet in urban areas. Signs on fixed supports are usually mounted on a single post, although those wider than thirty-six inches (36") or larger than ten (10) square feet should generally be mounted on two posts.

C. Under certain conditions, such as where a sign may be required for a few days duration and then is no longer needed, or where a sign is moved from location to location every few days, or where it is not practical or desirable to provide a fixed mounting, signs may be erected on a temporary type of support. Signs erected on temporary supports should be at a minimum height of three (3) feet.

D. Signs that are used during the day only to warn or guide traffic through and/or around construction or maintenance work areas, may be erected on portable supports. At the end of the work day, signs mounted on portable supports shall be cov-

R2-1

24"X30"

R3-3

24"X24"

R4-1

24"X30"

R11-2

48"X30"

R8-3

24"X30"

R1-1

30"X30"

R3-5L

30"X36"

R3-2

R3-2A

24"X24"
24"X30"

R4-7

R4-7A

24"X30"
24"X30"

W6-3

30"X30"

W1-6

24"X48"

W1-7

24"X48"

SIGNS SHOWN ARE MINIMUM SIZE

CW20-2B

48"X48"

CW21-1

36"X36"

CW20-3D

48"X48"

CW21-4D

36"X36"

CW4-2

36"X36"

CW20-7

36"X36"

CW20-1D

48"X48"

CW12-1

24"X24"

M4-8

12"X24"

G20-2

24"X60"

CW21-13

36"x36"
18"x24"

CW1-3R

30"x30"
18"x18"

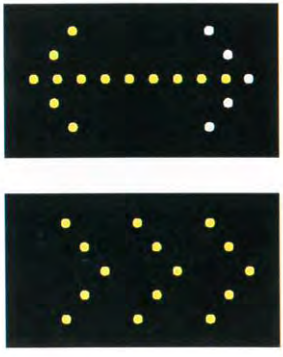
R20-3

42"x48"

CW1-8

18"x18"

FLASHING OR
SEQUENCING
ARROWS



TRAILER MOUNTED
INFORMATIONAL SIGN

ered or preferably removed from the view of traffic to a location far enough from the roadway so as not to be a hazard to the motorist. The bottom of signs mounted on portable supports shall be a minimum of one (1) foot above the pavement edge. Signs required for nighttime usage should not be mounted on portable supports.

E. Regardless of the type of support used, regulator signs shall be erected at a normal height of seven (7) feet above the pavement edge.

SECTION VIII - LIGHTING DEVICES

8.1 WARNING LIGHTS

A. Type "A" Low Intensity Flashing Warning lights are most commonly mounted on barricades, drums, vertical panels, or advance warning signs and are intended to continually warn drivers that they are approaching or proceeding in a hazardous area.

B. Type "A" Flashing Warning lights should always be used on at least the first two advance warning signs approaching a construction zone.

C. Type "B" High Intensity Flashing Warning lights are normally mounted on the advance warning signs or on independent supports. Extremely hazardous site conditions within the construction area may require that the lights be mounted on Type I Barricades, signs or other supports. As these lights are effective in daylight as well as dark, they are designed to operate 24 hours per day.

D. Type "C," steady burn lights shall be used to direct traffic to a new path and/or guide them through, or past, a construction zone at night. In tapers, transitions, or detours, where traffic

is guided to a new travel path, steady burn lights should be mounted on every device.

8.2 FLOODLIGHTING

A. When nighttime work operations are performed, adequate lighting shall be provided for the workmen so that they can work efficiently and safely. Where floodlights are used to illuminate the work site, care shall be taken to locate them at sufficient height or otherwise shield them from the eyes of motorists.

8.3 BEACONS

A. Rotating lights, beacons, and strobe lights are a very effective means of obtaining motorist attention. Beacons should also be used on vehicles performing moving or intermittent stop operations and on protection vehicles.

8.4 ARROW BOARDS

A. Application:

1. Special lighting panels are used for traffic warning and guidance. These devices are generally trailer-mounted and operate with a self-contained power source. They may also be mounted on trucks that are used to install traffic controls or to protect a moving operation.

2. The arrow board is used when a lane is closed. It tells the motorist that he shall merge into the adjacent lane as shown by the direction of the arrow.

3. The arrow board panels may display an arrow or a chevron type pattern. They may be flashed off and on or in a sequential pattern. Arrow boards are supplementary devices which are used in addition to the devices shown in the typical layouts contained in this manual.

B. Position:

1. The arrow board shall be located and "aimed" to achieve maximum visibility under the prevailing site conditions and approach alignment. The arrow board shall be placed so that the device is inside the taper.

C. Use:

1. The following considerations apply to the use of special lighting panels:

- High intensity light is needed in daytime; low intensity at night to avoid glare.
- Angle the panel in the vertical direction such that the lights are directed along the roadway.
- When the board is repositioned within the same project for a subsequent phase of the work, this new application can be indicated by changing the display. Avoid placing the arrow board on or around curves.

SECTION NO. IX - FLAGGERS OR POLICE OFFICERS

9.1 WHEN USED

A. If traffic congestion warrants, or if the inspector on the job determines it necessary, the contractor shall provide flaggers for adequate traffic control. Flaggers or police officers are mandatory at locations where equipment is intermittently blocking a traffic lane, or where only one lane is available for two directions of traffic. If covers or hills are present, a minimum of two flaggers are required.

9.2 CONTROL OF TRAFFIC THROUGH WORK AREAS

A. The Transportation Department, Engineering Services Department, the Public Works Department, the Police Department, and/or the Fire Department may determine if an emergency exists that may require on-duty police officers to maintain traffic control on a particular project.

B. The availability of free Police manpower for assistance in construction or in traffic work is generally limited to emergencies only, as their services are required elsewhere. Off-duty police officers may be employed directly by the contractor to maintain traffic control.

C. Any traffic control through a traffic signal controlled intersection shall be done by a police officer <u>only</u>.

9.3 HAND SIGNALING DEVICES

A. A number of hand signaling devices, such as red flags, STOP/SLOW paddles and flashlights are used in controlling traffic through work areas. The sign paddle bearing the clear messages "STOP" or "SLOW" is the preferred device for daytime operation. The flashlight should supplement flags and paddles for night time control.

B. Sign paddles shall be at least 18 inches wide with letters at least 6 inches high. A rigid handle shall be provided. This combination sign may be fabricated from sheet metal or other light semi-rigid material. The background of the "STOP" face shall be red with white letters and border. The background of the "SLOW" shall be orange with black letters and border. When used at night the "STOP" face shall be reflectorized red with white reflectorized letters and border, and the "SLOW" face shall be reflectorized orange with black letters and border.

C. The flashlight shall have a red extension (wand type) to properly alert traffic at night. The best combination for nighttime traffic control is a flashlight used with the STOP/SLOW reflective paddle.

D. Flags used for signaling purposes shall be a minimum of 24" x 24" in size, made of a good grade of red material securely fastened to a staff approximately 3 feet in length. The free edge shall be weighted to insure that the flag will hang vertically even in heavy winds.

VESTS

Flagmen when on duty shall wear orange colored safety vests as an outer garment. The vest shall be so made as to be adjustable in the side to fit properly. All apparel shall be of a neat appearance. In emergencies and during inclement weather, the attire may be altered as approved by Engineer.

HELMET or CAP

The use of a orange or white safety helmet or cap is preferred.

FLAG

FLAG

SIZE 24"x24", 36" + Staff. Free edge of flag shall be weighted.

MATERIAL Vinyl bonded to nylon fabric material

COLOR Red

STOP & SLOW SIGNS

STOP & SLOW — Two Sided Sign

SIZE 18"x18" minimum

MATERIAL SIGN: Aluminum .081 plate or comparable light weight material.
STAFF: 9" minimum length thinwall conduit tubing or comparable light weight material.

COLOR STOP Sign: Red field with white letters and border.
SLOW Sign: Orange field with black letters and border.

LETTERS 6" Series C for STOP Sign
6" Series B for SLOW Sign

Typical Flagman Equipment

E. Lights approved by the appropriate highway authority or reflectorized sign paddles or reflectorized flags shall be used to flag traffic at night. A red lantern or flashlight with a red traffic wand may be acceptable to flag traffic at night. To stop traffic, the light shall be waved back and forth across the path of the approaching vehicle as shown below. After the first vehicle has been stopped, the flagger shall move to a position where his signal can be seen by other drivers approaching the stopped vehicle. The signal to proceed shall be given by lowering the light and either telling the driver to proceed or using the daytime hand motion. Otherwise, daytime flagging procedures shall be followed whenever paddles or flags are used at night.

NIGHTTIME FLAGGER

9.4 FLAGGERS

A. A properly trained and certified flagger shall be one demonstrating knowledge of "FLAGGER HAND SIGNALS" in accordance with the illustrations of proper hand signals on Page 43 of this manual. Use of the proper hand signals is mandatory in order to prevent confusion of the motorist. The red hand flag or hand "STOP" and "SLOW" signs shall be used by the flagger.

B. Since flaggers are responsible for human safety and make the greatest number of public contacts of all construction personnel, it is important that qualified personnel be selected. A flagger shall possess the following minimum qualifications:
   1. Average intelligence.
   2. Good physical condition, including sight and hearing.
   3. Mental alertness.
   4. Courteous but firm manner.
   5. Neat appearance.
   6. Sense of responsibility for safety of public and crew.

C. The use of orange clothing such as a vest, shirt, or jacket shall be required for flaggers. For nighttime conditions, similar outside garments shall be reflectorized.

D. Flaggers are provided at work sites to stop traffic intermittently as necessitated by work progress or to maintain continuous traffic past a work site at reduced speeds to help protect the work crew. For both of the functions the flagger shall, at all times, be clearly visible to approaching traffic for a distance sufficient to permit proper response by the motorists to the flagging instructions, and to permit traffic to reduce speed before entering the work site. In positioning flaggers, consideration shall be give to maintaining color contrast between the flagger's protective garments and his background. A flagger should not be in the traffic stream.

9.5 FLAGGING PROCEDURES

A. The following methods of signaling with sign paddles shall be used:

1. To Stop Traffic: The flagger shall face traffic and extend the "STOP" sign paddle in a stationery position with the arm extended horizontally away from the body. The free arm is raised with the palm toward approaching traffic.
2. When it is Safe for Traffic to Proceed: The flagger shall face the traffic with the "SLOW" sign paddle held in a stationery position with the arm extended horizontally away from the body. The flagger motions traffic ahead with the free hand.
3. When it is Desired to Alert or Slow Traffic: The flagger shall face traffic with the "SLOW" sign paddle held in a stationery position with the arm extended horizontally away from the body.

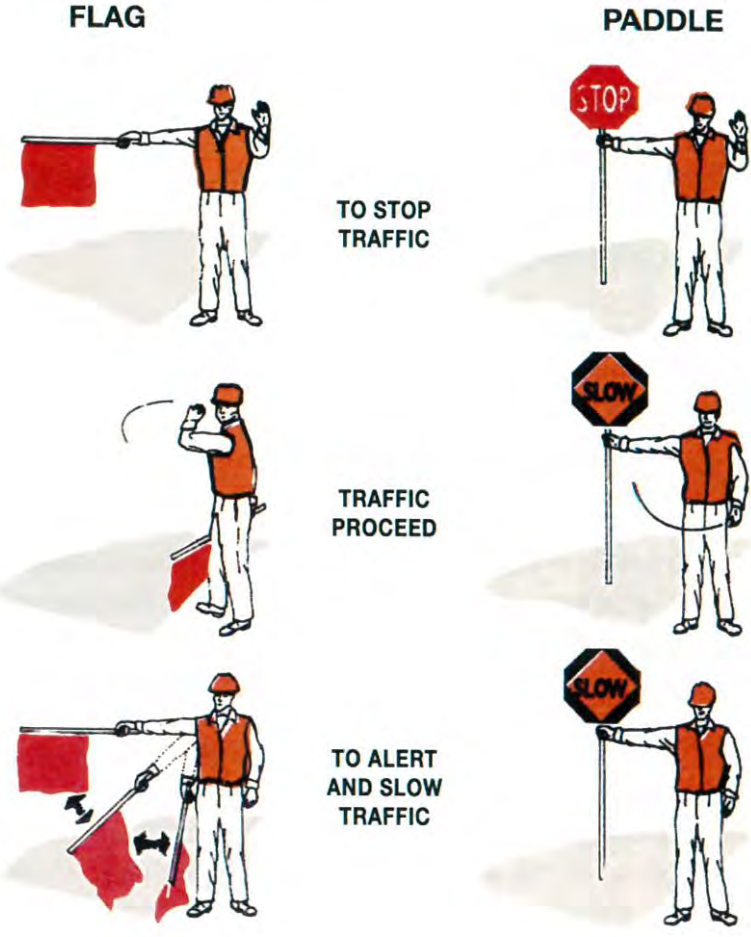
B. The following methods of signaling with a flag shall be used:

1. To Stop Traffic: The flagger shall face traffic and extend the flag horizontally across the traffic lane in a stationery position so that the full area of the flag is visible hanging below the staff.

For greater emphasis, the free arm may be raised with the palm toward approaching traffic.

2. When it is Safe for Traffic to Proceed: The flagger shall stand parallel to the traffic movement, and with flag and arm lowered from view of the driver, motion traffic ahead with his free arm. Flags shall not be used to signal traffic to proceed.
3. Where it is Desired to Alert or Slow Traffic: The flagger shall face traffic and slowly wave the flag in a sweeping motion of the extended arm for the shoulder level to straight down without raising the arm above a horizontal position.

The use of the flag and sign paddle are illustrated below:



9.6 FLAGGER STATIONS

A. Flagger stations shall be located far enough in advance of the worksite so that approaching traffic will have sufficient distance to reduce speed before entering the project. This distance is related to approach speed and physical conditions at the site; however, 200 to 300 feet is desirable. In urban areas when speeds are low and streets closely spaced, the distance necessarily shall be decreased.

B. The flagger should stand on the shoulder adjacent to the traffic being controlled in the barricaded lane. At a "spot" obstruction a position may have to be taken on the shoulder opposite the barricaded section to operate effectively. Under no circumstances should a flagger stand in the lane being used by moving traffic. The flagger shall be clearly visible to approaching traffic at all times. For this reason the flagger shall stand alone, never permitting a group of workers to congregate around the flagger station. The flagger shall be stationed sufficiently in advance of the work force to warn them of approaching danger, such as out-of-control vehicles.

C. Flagger stations should be adequately protected and preceded by proper warning signs. At night, flagger stations shall be adequately illuminated.

9.6 ONE-WAY TRAFFIC CONTROL

A. Where traffic in both directions must, for a limited distance, use a single lane, provision shall be made for alternate one-way movement to pass traffic through the constricted section. At a "spot" obstruction, such as an isolated pavement patch, the movement may be self-regulating. However, where the one-lane section is of any length, there shall be some means of coordinating movements at each end so that vehicles are not simultaneously moving in opposite directions in the section and so that delays are not excessive at either end. Control points at each end of the route should be chosen so as to permit easy passing of opposing lines of vehicle.

B. Access shall be controlled throughout the construction or maintenance work zone. Closure of all intersections within the zone is suggested. Driveways create a problem that should be monitored by flaggers. Flaggers shall have good visual contact or radio contact with each other.

C. Alternate one-way traffic control may be affected by the following means:

1. Flagger Control
2. Flag-carrying or official car
3. Pilot car
4. Traffic signals

9.8 FLAGGER CONTROL:

A. Where the one-lane section is short enough so that each end is visible from the other end, traffic may be controlled by means of a flagger at each end of the section. One of the two shall be designated as the chief flagger for purposes of coordinating movement. They shall be able to communicate with each other verbally or by means of signals. These signals shall not be such as to be mistaken for flagging signals.

B. Where the end of one-lane section is not visible from the other end, the flaggers may maintain contact by means of radio or field telephones. So that a flagger may know when to allow traffic to proceed into the section, the last vehicle from the opposite direction can be identified by description or license.

SECTION X — OTHER TRAFFIC CONTROL MEASURES

10.1 FLAG-CARRYING OR OFFICIAL CAR

A. The following procedure is known as "flag-carrying." The driver of the last vehicle proceeding into the one-lane section is given a red flag (or other token) and instructed to deliver it to the flagger at the other end. The opposite flagger upon receipt of the flag then knows that it is safe to allow traffic to move in other directions.

B. Flag carrying is effective when the route is well defined and non-hazardous. It should be employed only when the one-way traffic is confined to a relatively short stretch of road, usually not more than 1 mile in length. The flag-carrying car method should only be used when no points of ingress or egress occur within the work zone.

C. A variation of this method is the use of an "official" car which always follows the last vehicle proceeding through the section. The use of an official car eliminates the possibility of loss of the flag.

10.2 PILOT CAR

A. The use of a pilot car for traffic control can be most effective where the route is particularly hazardous, or so involved or frequently altered as to preclude adequate signing. The pilot car is used to guide a train of vehicles through the job or detour. Its operation shall be coordinated with flagging operation or other controls at each end of the one-lane section. Sufficient turn-around room shall be provided at these points. Provisions shall be made for identification of the last vehicle in the column.

B. The vehicle selected for pilot car study should be lightweight and easy to handle, and shall have the name of the contractor or contracting authority prominently displayed. The pilot car sign should be mounted on the rear of the vehicle.

C. The pilot car can keep the speed of traffic slow and if equipped with a "WRONG WAY" sign mounted facing the front of the vehicle can warn drivers that may be attempting to drive in the wrong direction from internal points of entry in front of the oncoming platoon.

D. Two or more pilot cars may be used to guide two-way applications to control vehicular traffic through a particularly complex or hazardous detour.

10.3 TRAFFIC CONTROL SIGNALS

A. Traffic control signals may be used for special applications to control vehicular traffic movements at construction or maintenance work areas. Typical applications include:

1. A highway or street intersection with a temporary "haul road" or equipment crossing.

2. Through areas requiring one-way traffic operations.

B. If used, the traffic control signal faces shall be installed at each approach to the one-lane section, and drivers shall be warned of their presence by means of the CW3-3 "SIGNAL AHEAD" sign preceded by appropriate construction approach warning signs.

C. The traffic signal controller should be timed so that a short green interval will allow drivers to enter the one-way zone while opposing traffic is halted. Upon experimentation of the green time, and following a yellow clearance interval, the signal faces at both ends shall show red for a sufficient time for traffic to clear the zone at the minimum normal speed expected through the zone. Only then shall the green be shown for the opposite movement of traffic. Signal controller timings and installation drawings will be determined by the Transportation Department.

D. All traffic signal and control equipment shall meet the applicable standards and specifications prescribed in the TMUTCD. Normally, these installations should be operated by means of traffic actuation or fixed time control.

10.4 MOVING ACTIVITIES

A. The key elements for moving operations on or near the roadway are sufficient warning and visibility. Vehicles used for these operations should be made highly visible with appropriate equipment, such as: flashing lights, rotating beacons, flags, or signs. It may be desirable for other traffic control devices such as cones and barricades to be carried on the vehicle for use in controlling traffic.

10.5 FAST MOVING ACTIVITIES

A. A fast moving activity may involve operation such as sweeping and striping, which move at a relatively rapid pace, making traffic control device set ups for stationery work zones impractical. The work vehicle should be highly visible and should be followed by a protection vehicle. This protection vehicle shall have at least one of the following to warn approaching traffic, direct motorists on which side to pass and also to protect the work vehicle:

1. Flags,
2. Flashing lights and a sign, or
3. A flashing or sequencing arrow panel.

B. On roadways with low traffic volumes, relatively flat grades and straight alignment, a single work vehicle well-marked with the appropriate devices will usually be sufficient.

10.6 SLOW MOVING ACTIVITIES OR INTERMITTENT STOP ACTIVITIES

A. Slow moving operations may involve such work as pavement marking or placement while intermittent stop operations may involve such work as pot hole patching. When performing such work on the roadway, a protection vehicle should be used to warn traffic and protect workmen. Where feasible, advance warning signs should be placed along the roadway and periodically moved up as the work progresses. On low volume roads, a single vehicle equipped with signs, beacons, and/or a flashing or sequencing arrow panel may suffice if there is good visibility.

B. When slow-moving operations are performed on high-speed roadways, it may be necessary to use one or more backup vehicles equipped with signs or flashing or sequencing arrow panels. These vehicles may provide a taper by having the rear vehicle in the train straddle the shoulder and the forward backup vehicle shadow the work vehicle.

C. For some operations on the shoulder or off of the roadway, such as litter pickup and herbicide spraying, a well-marked work vehicle may be sufficient.

SECTION XI - TEMPORARY FACILITIES

11.1 EXCAVATION TRENCHES

A. The city of Arlington shall require that all excavation trenches on all streets 37' wide or wider, or listed on the Thoroughfare List, or listed in Section 2.5, State Highway List, or required by the Director of Transportation or his designee, be back filled or covered and the street opened to traffic between the hours of 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m. weekdays. Only the Director of Transportation or his designee may authorize any deviation from these hours.

B. When an open trench must be covered and back filling is not practical, authorized covers shall be used. Either steel plates or a fiberglass type roadway plate shall be used.

11.2 STEEL PLATES

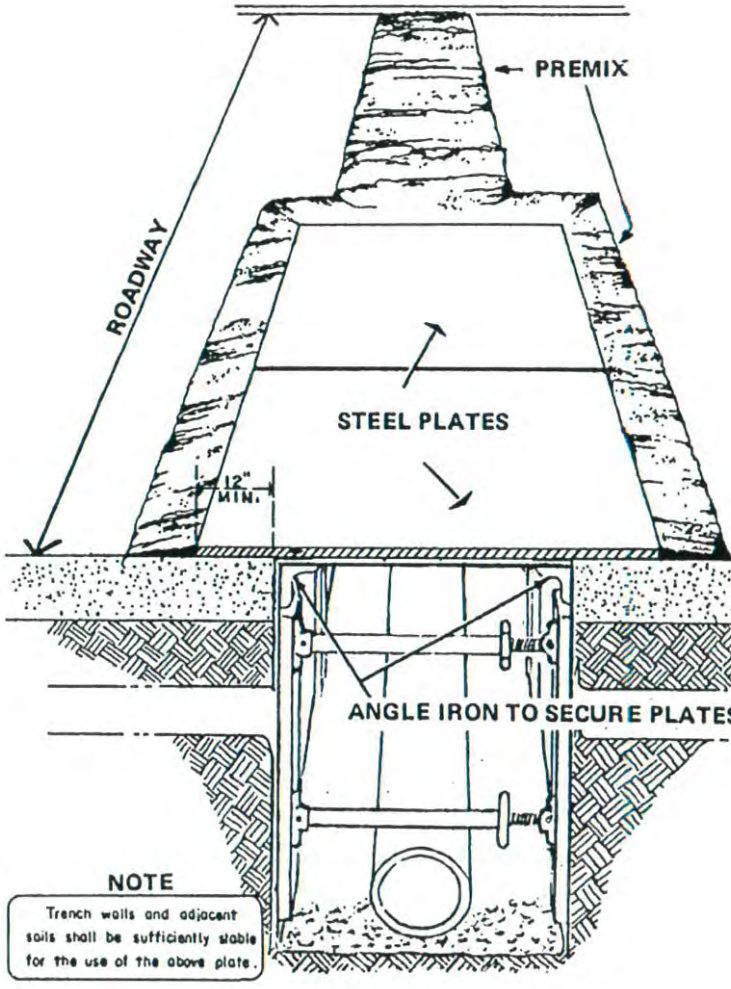
A. Steel plates must overlap the trench at least one (1) foot on each side of the trench, and shall be used in accordance with the chart listed on Page 47 of this manual.

B. The trench shoring must be such to permit the use of a roadway cover.

C. All trenches over four (4) feet wide must be backfilled. All steel plates must be securely anchored to the pavement and an asphalt ramp must be installed around the plate to keep it smooth and secure.

11.3 FIBERGLASS PLATE

A. The fiberglass plate is a 5' x 6' roadway plate that was developed as a replacement for steel plates on any road cut not exceeding four (4) feet in width. This lightweight plate weighs 182 lbs. and will support a static axle load of 32,000 lbs. This plate is approved by the Federal Highway Administration and may be used in lieu of a steel plate.



WIDTH OF TRENCH	MINIMUM THICKNESS OF STEEL PLATES
1.0 feet	½ inch
1.5 feet	¾ inch
2.0 feet	⅞ inch
3.0 feet	1 inch
4.0 feet	1¼ inch

PLATE BRIDGING

11.4 TEMPORARY MEDIAN CROSSOVER

A. Two types of median crossovers have been developed and shall be used when construction traffic control plans are such that one direction of traffic must be channeled across a median into the opposite oncoming lanes.

1. Type A Asphalt ramped median crossovers shall be designed so that the traffic shall encounter the tapered ramp before entering the turn to cross over the median. Typical Drawing on Page 49.

2. Type B median crossovers shall be such that the curb is removed on each side of the median and a roadway is constructed across the median and through the curb openings. Typical Drawing on Page 50.

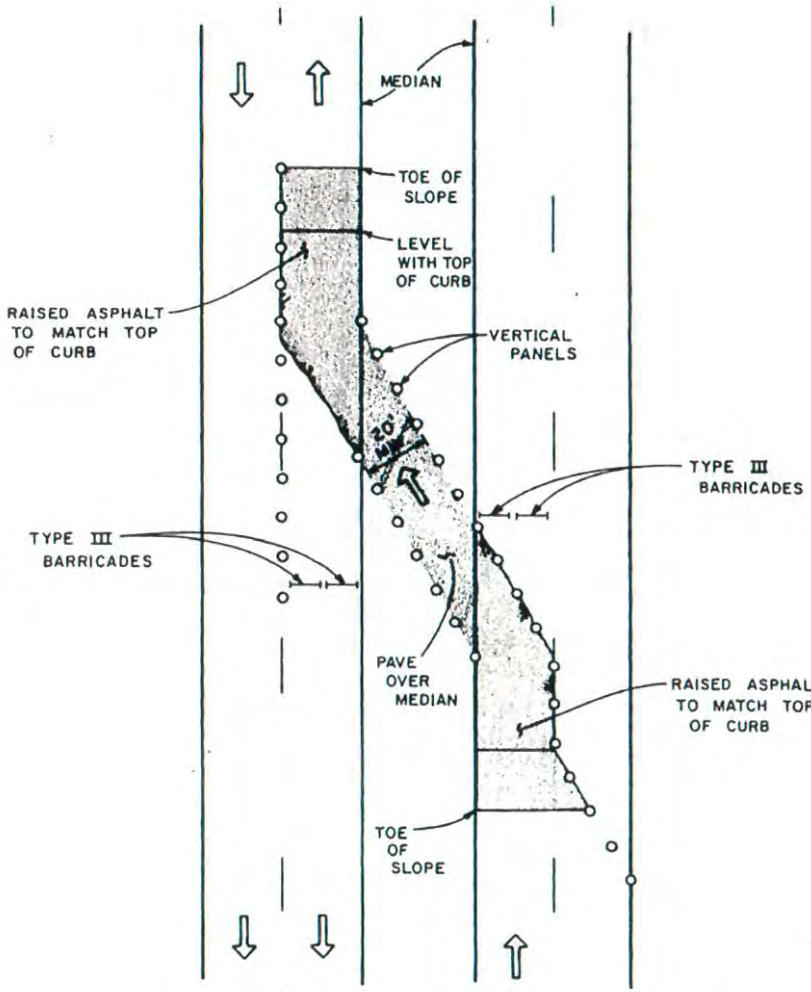
B. The crossover angle shall be at such a ratio that the speed of traffic will not be lowered more than 10 MPH less than the posted speed of the normal roadway.

C. The asphalt ramp or the curb removal shall be repaired to its original condition by the contractor, as if no change had ever occurred.

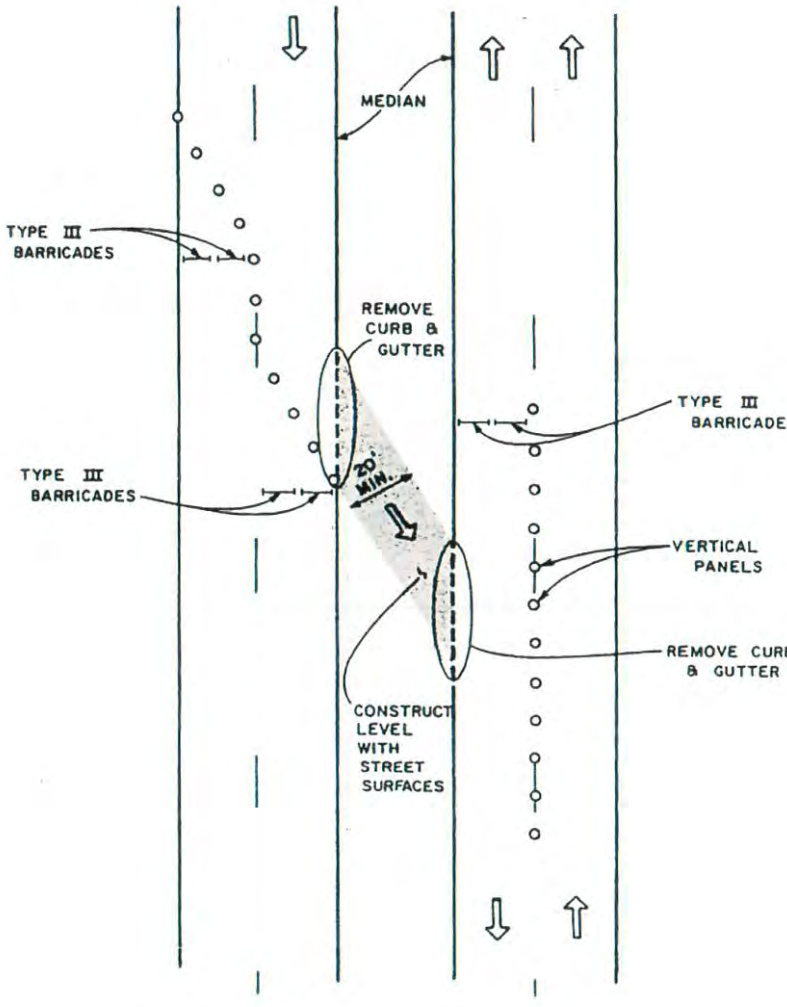
11.5 BYPASS ROADS

A. It is sometimes necessary to keep two-way traffic flowing at all times on some city streets. The following guidelines shall be used by the Director of Transportation or his designee in determining when a bypass road will be required.

B. When a projected increase in traffic on a residential street is greater than 500 vehicles per day and the detour is to last more than 7 days, a temporary bypass road may need to installed to eliminate heavy residential traffic.



TYPICAL TYPE 'A' MEDIAN CROSSOVER



TYPICAL TYPE 'B' MEDIAN CROSSOVER

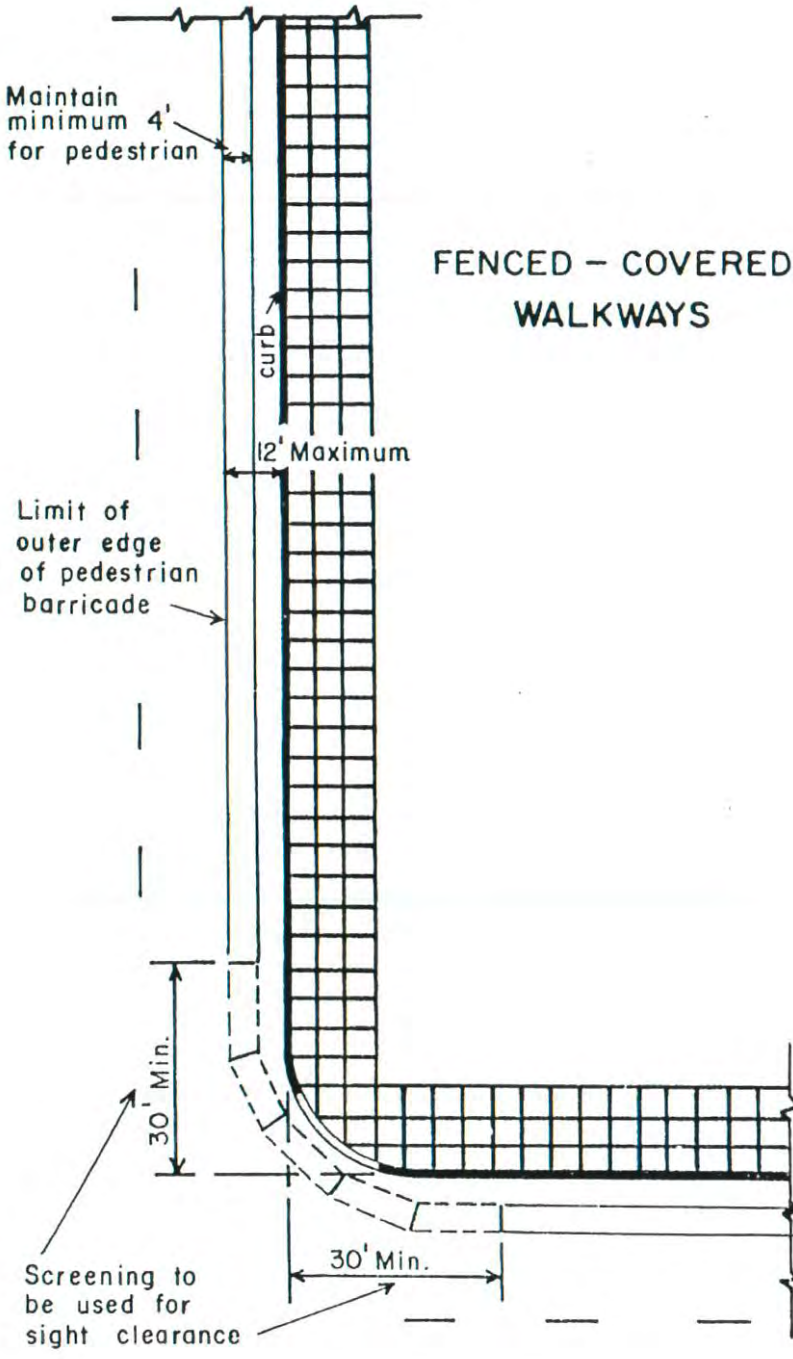
SECTION XII — PEDESTRIAN PROTECTION IN A CONSTRUCTION AREA

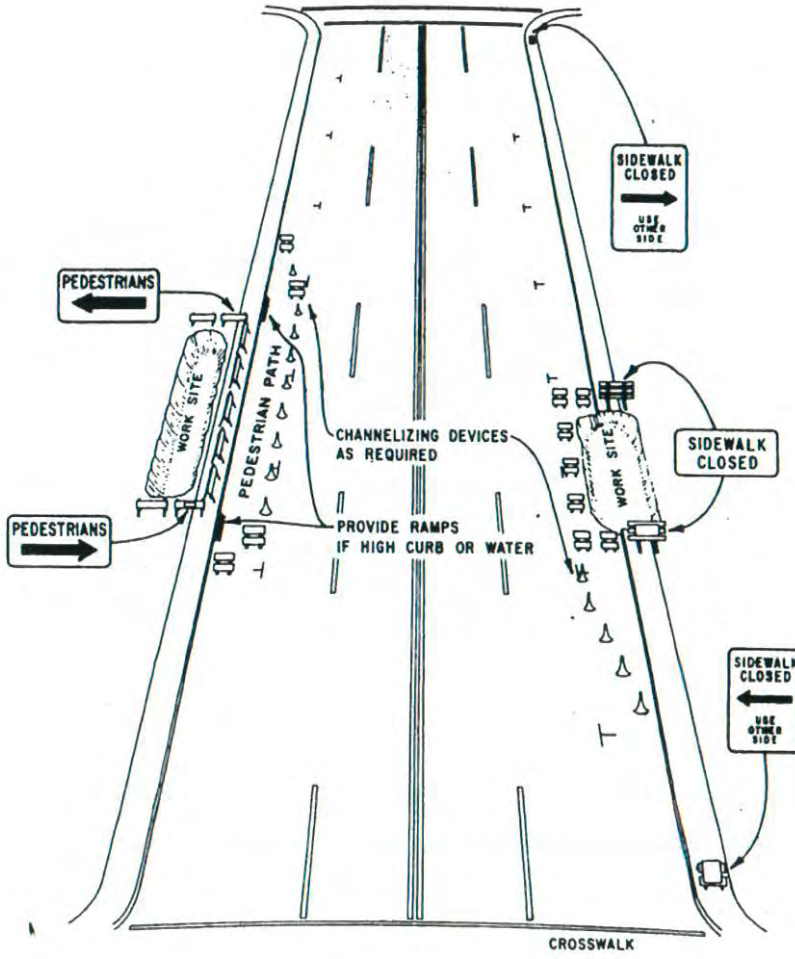
12.1 PEDESTRIAN WALKWAYS

A. Pedestrian traffic shall be considered in all work areas. When possible, a pedestrian walkway network shall be provided on the side of the street affected by the construction. In some cases a fence-covered walkway will be required to protect pedestrians from activity at a building under construction. If there is not a method of providing proper safety for the pedestrian on the construction side of the street, the sidewalk shall be signed and physically closed and pedestrian crosswalks and directional signs shall be installed. If the entire street and sidewalk is removed due to construction, a temporary wooden walkway system should be provided for pedestrian activity areas such as an elementary school.

12.2 REQUIREMENTS REGARDING PEDESTRIAN FENCE-COVERED WALKWAYS

A. All pedestrian fence-covered walkways shall be constructed in accordance with this manual and the city of Arlington "Construction" Chapter. All such walkways shall be properly lighted both inside and outside. The Transportation Department shall be contacted if signals or other traffic control devices are obscured by fence-covered walkways at any intersection. Provisions must be made to relocate signal equipment and/or signs. The view around the corner cannot be obstructed for a distance of 30 ft. from each corner. A wire mesh may be used to give the pedestrian necessary protection as well as to provide adequate vision at the intersection.


Maintain minimum 4' for pedestrian
FENCED – COVERED WALKWAYS
curb
12' Maximum
Limit of outer edge of pedestrian barricade
30' Min.
30' Min.
Screening to be used for sight clearance



TYPICAL SIDEWALK AND CURB-LANE CLOSURE
FOR PEDESTRIAN CONTROL

SECTION XIII — ENFORCEMENT

13.1 VIOLATIONS

The Director of Transportation or his designee shall have the authority to enforce the provisions of this Manual:

A. When the Director of Transportation or his designee determines that any person has failed to obtain a permit required by this manual, or has failed to erect barricades and/or other traffic control devices or warning devices required by this manual, or has failed to submit any plan required by this manual, or that work is being performed in violation of this manual, the Director of Transportation or his designee may issue to such person an order to stop such work until the requirements of this manual have been met.

B. Failure to obey such "stop work order" shall be a misdemeanor, and each day work continues contrary to such order shall be a separate offense.

13.2 INTENT

A. A person commits an offense if he knowingly violates any provision of this manual.

13.3 PENALTIES

A. Violation of any provision of this manual shall be considered a misdemeanor offense, punishable by a fine not to exceed Five Hundred Dollars and No Cents ($500.00). Each day that a violation is allowed to continue shall be a separate offense.

SECTION XIV — ILLUSTRATIONS

A. Flashing warning lights and/or flags should be used to call attention to the early warning signs.

B. Devices used in a series for channelization purposes at night shall be supplemented with steady burn lights or delineators as needed.

C. All distances and spacings shown are approximate.

D. All traffic control devices used at night shall be reflectorized or illuminated.

E. The word "AHEAD" may be substituted for the actual distances on the advance warning signs where applicable.

F. The word utility may be substituted for "ROAD" in all signs where applicable.

G. Where a taper is used, the taper formula is:

$L = SxW$ for speeds of 45 MPH or more.

$L = WS_2$ for speeds of 40 MPH or less.

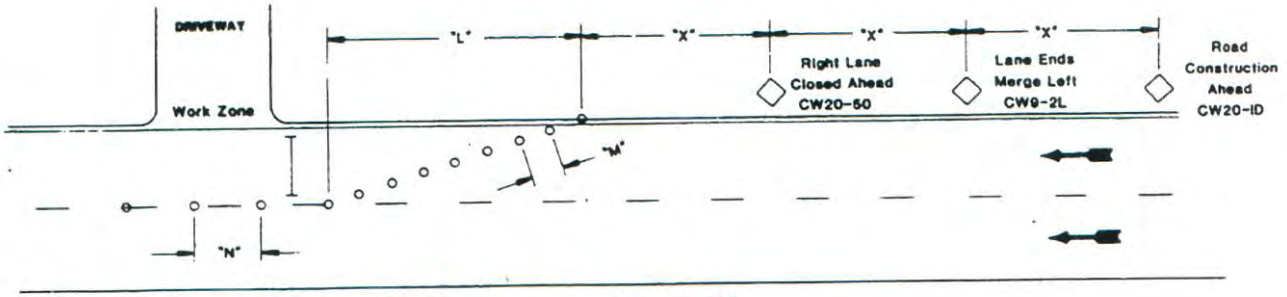
Where:

L = minimum length of taper

S = numerical value of posted speed limit or 85th Percentile Speed

W = width of offset in feet

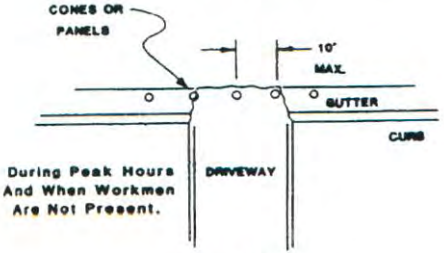
H. Where channelizing devices are used, the maximum spacing between channelizing devices in a taper should be approximately equal in feet to the speed limit.



○ Traffic Cones, Vertical Panels, Or Type II Barricades.

Layout "A"

Layout "A" For Daytime Use Only Between The Hours Of 9:00 A.M. And 4:00 P.M. When Workmen Are Present.



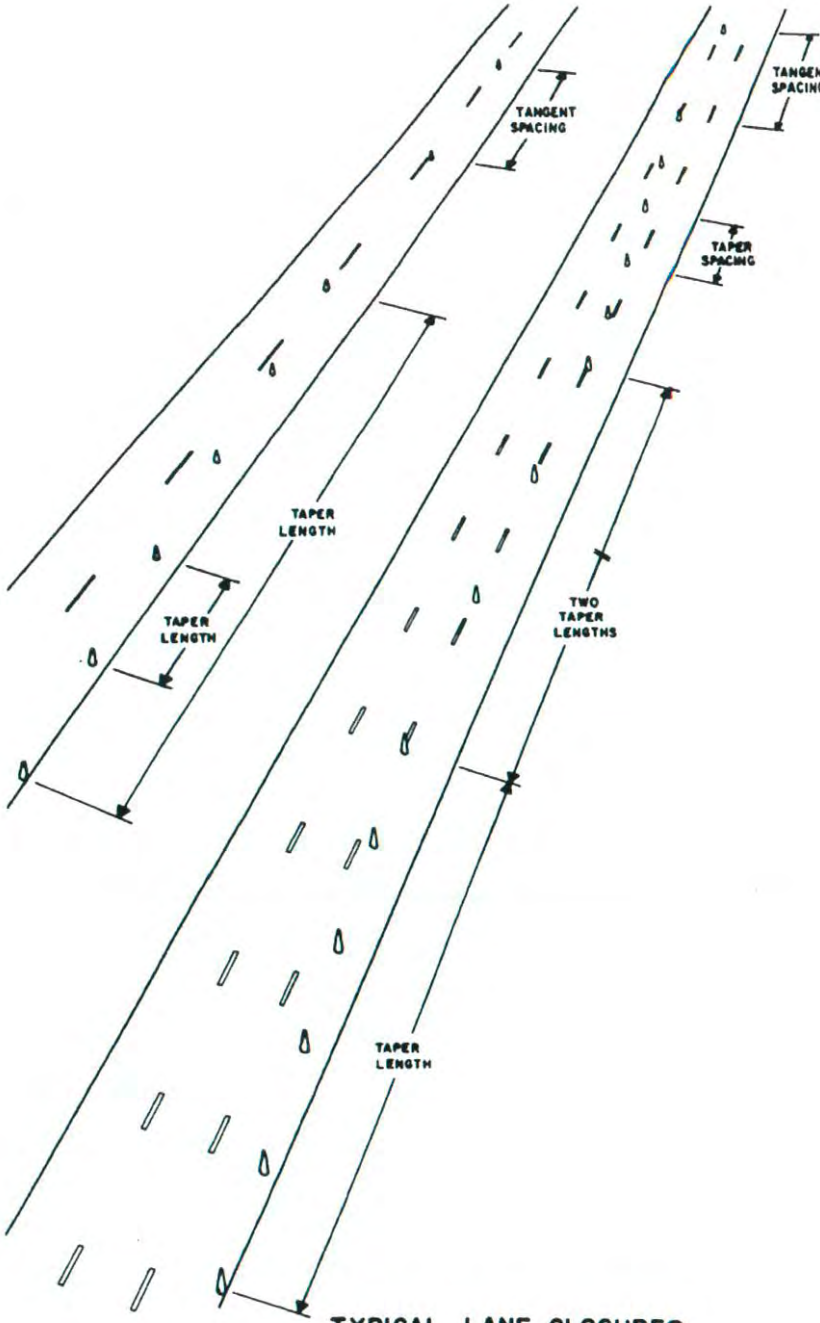
During Peak Hours And When Workmen Are Not Present.

Layout "B"

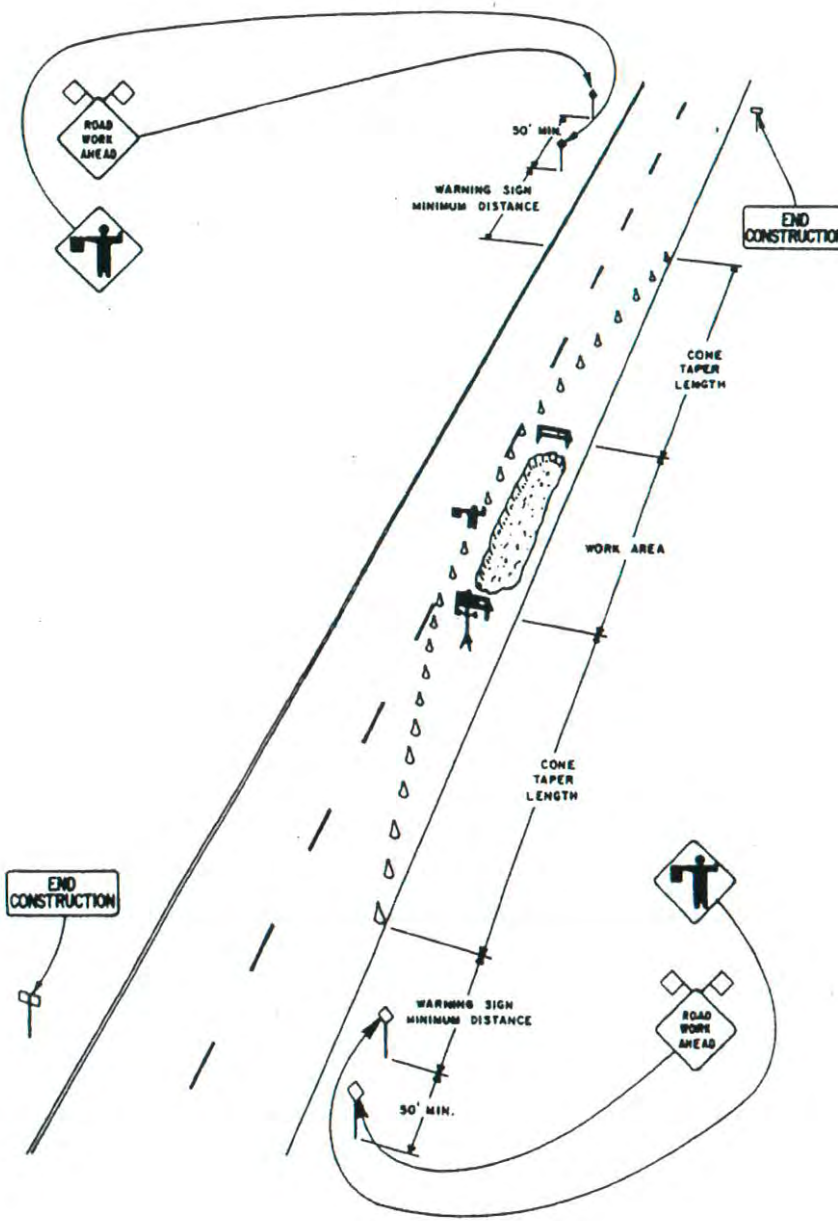
TYPICAL TRANSITION LENGTHS
AND
SUGGESTED MAXIMUM SPACING OF DEVICES

Posted Speed	Formula	Minimum Desirable Taper Lengths 10' Offset	11' Offset	12' Offset	Warning Sign Size	Suggested Maximum Spacing of Device On a Taper	On a Tangent	Sign Spacing
30	$L=\frac{WS^2}{60}$	150	165	180	36" x 36"	30	60'-75'	125'
35		205	225	245		35	70'-90'	160'
40		265	295	320		40	80'-100'	200'
45	L=W x S	450	495	540	48" x 48"	45	90'-110'	250'
50		500	550	600		50	100'-125'	300'
55		550	605	660		55	110'-140'	375'
60		600	660	720		60	120'-150'	500'
		"L"				"M"	"N"	"X"

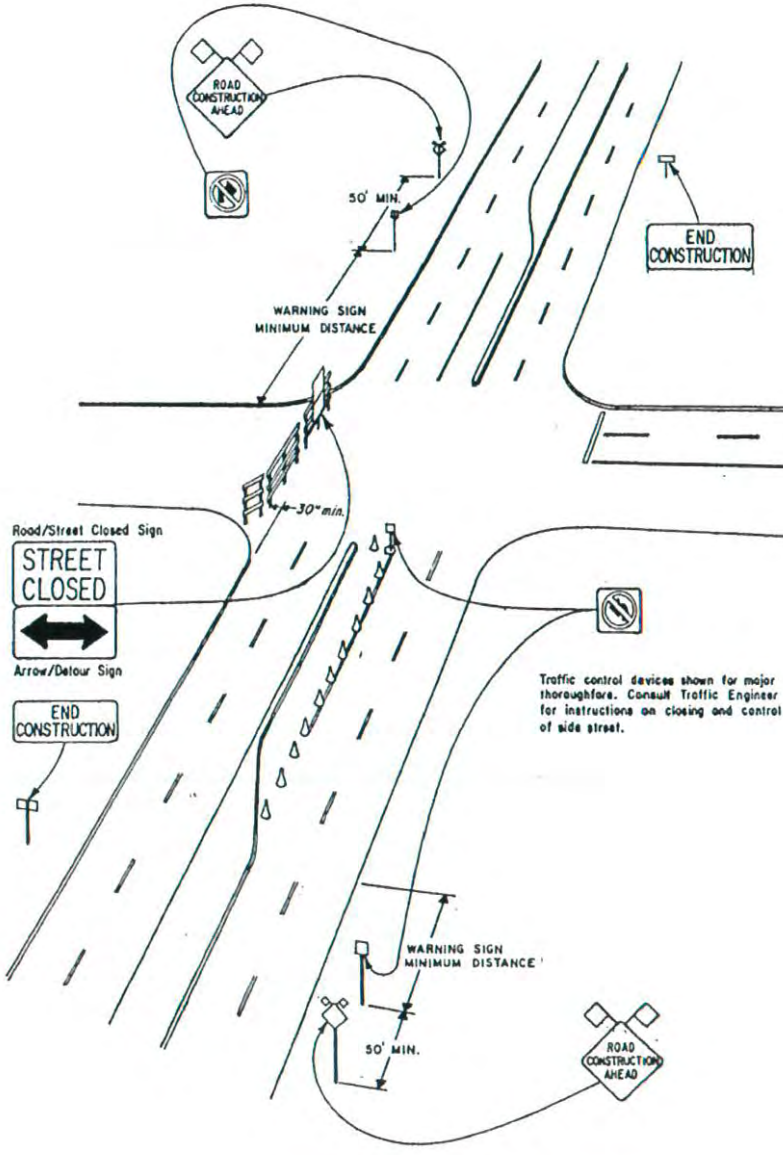
Minimum distance from work to 1st Advance Warning sign and/or distance between each additional sign



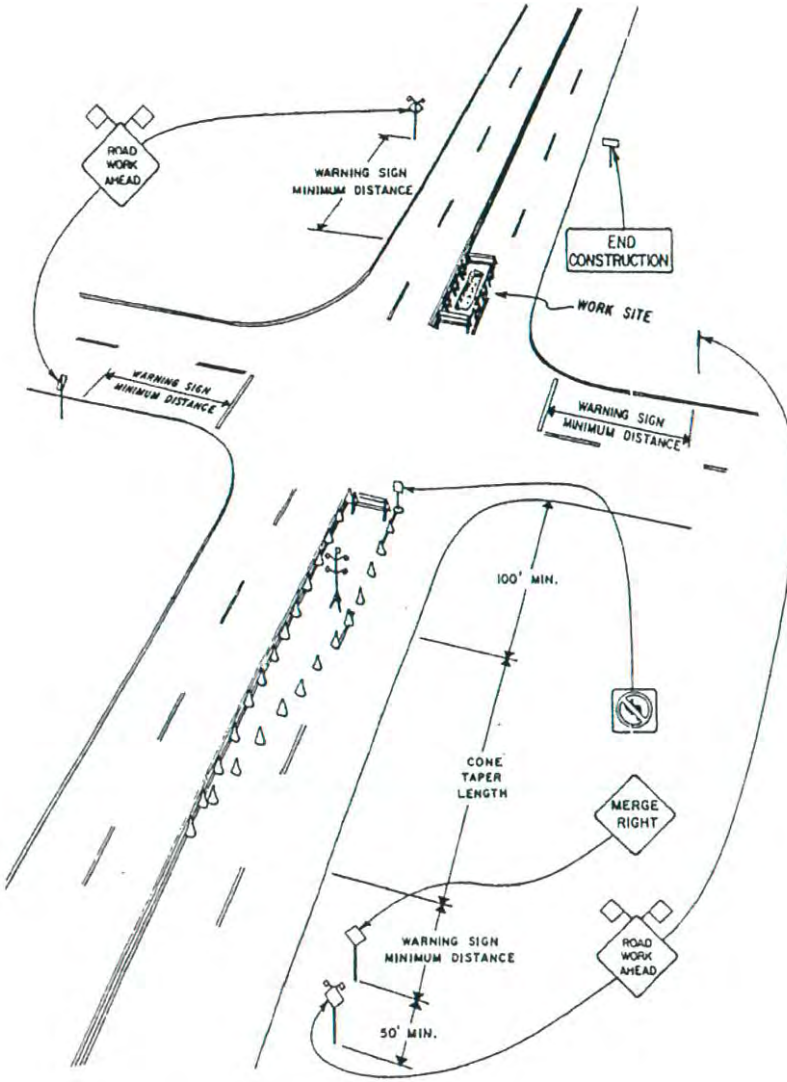
TYPICAL LANE CLOSURES



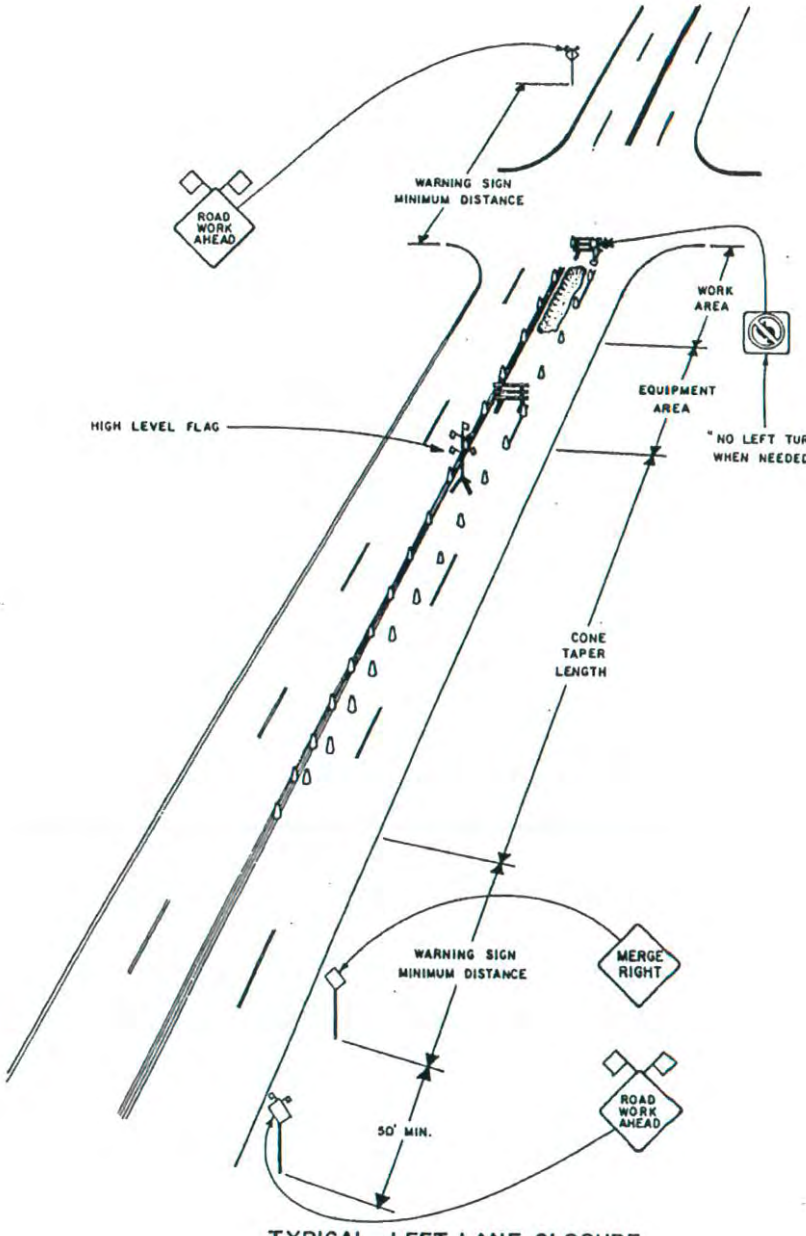
TYPICAL FLAGGER CONTROL
HALF CLOSURE OF TWO-WAY STREET



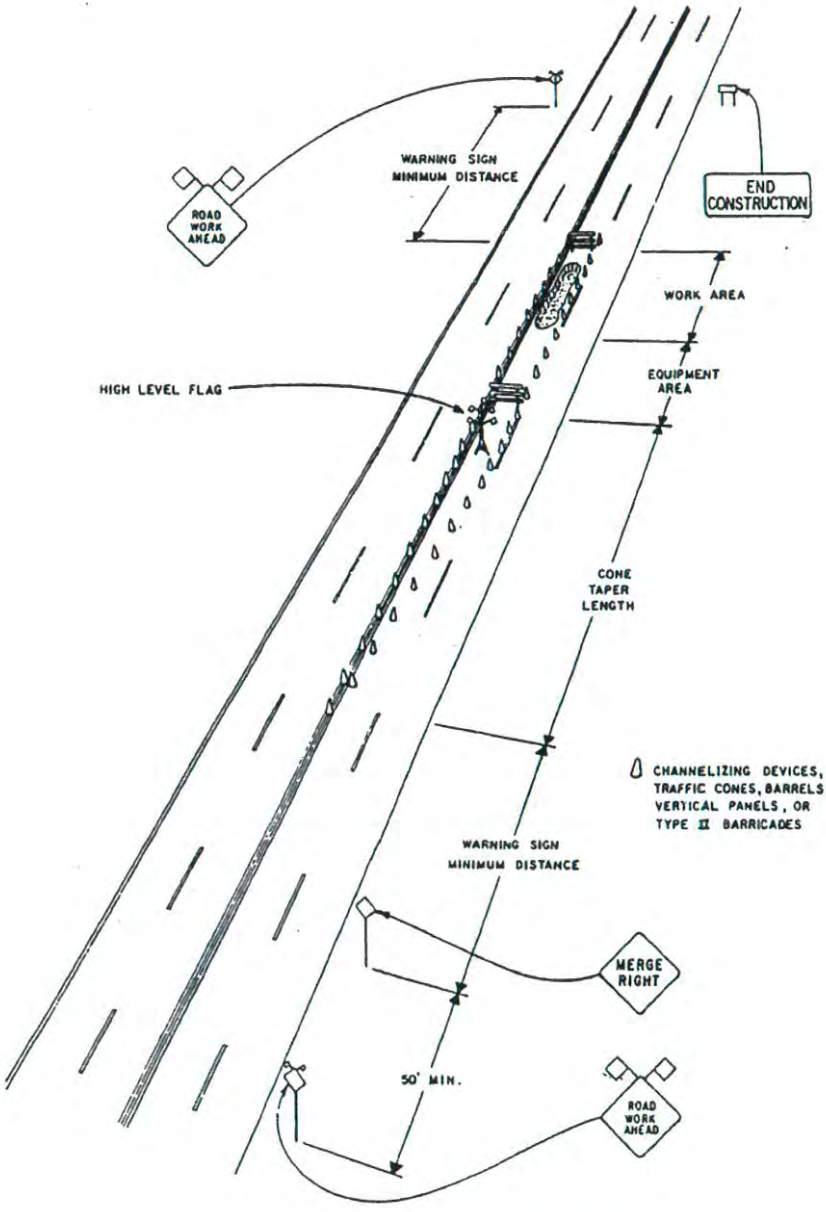
TYPICAL SIDE STREET CLOSURE
TO MAJOR THOROUGHFARE



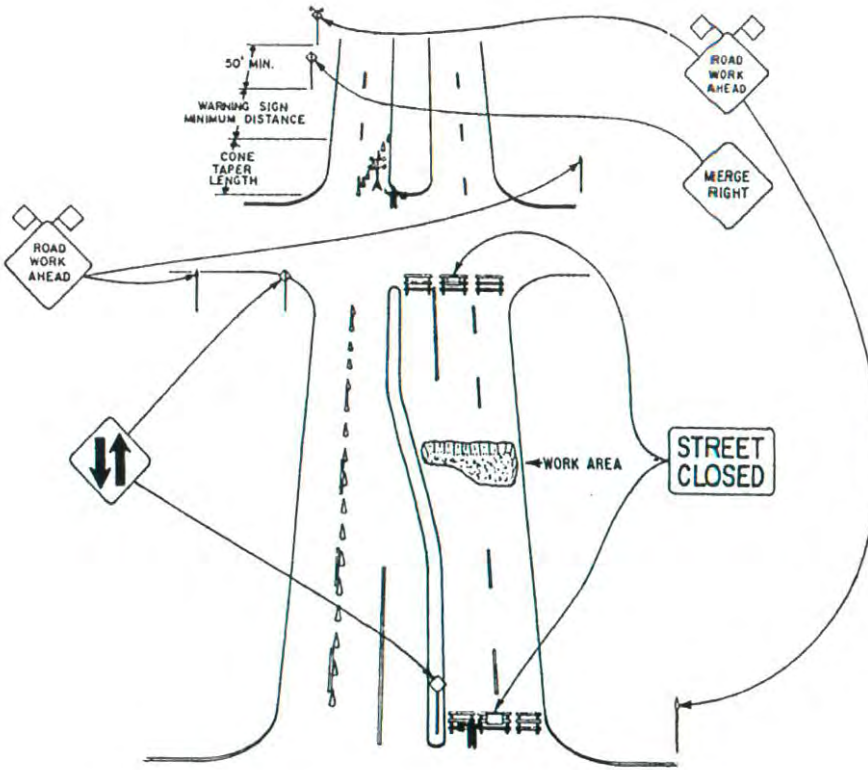
TYPICAL INSIDE LEFT LANE CLOSURE
FAR SIDE OF INTERSECTION
LEFT TURN PROHIBITED

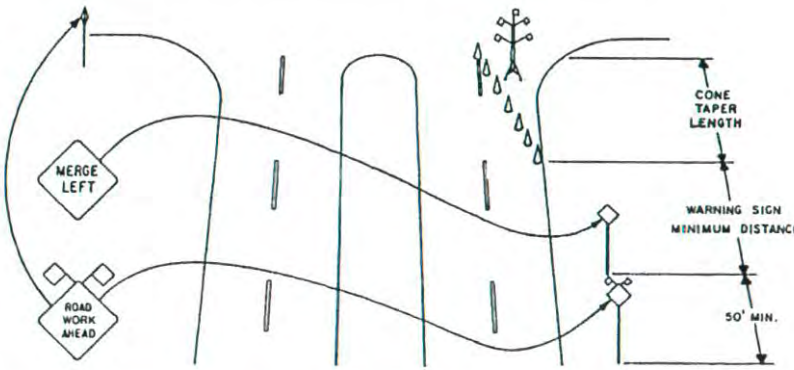


TYPICAL LEFT LANE CLOSURE
NEAR SIDE OF INTERSECTION

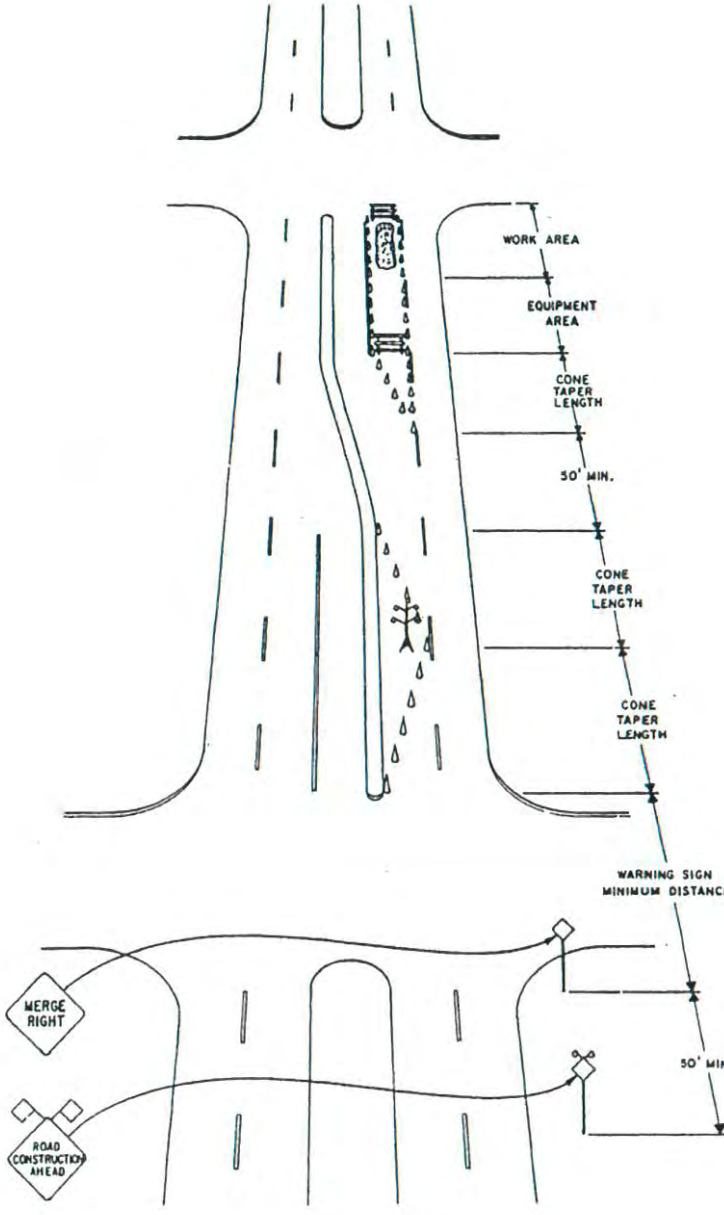


TYPICAL INSIDE LANE CLOSURE
MID-BLOCK

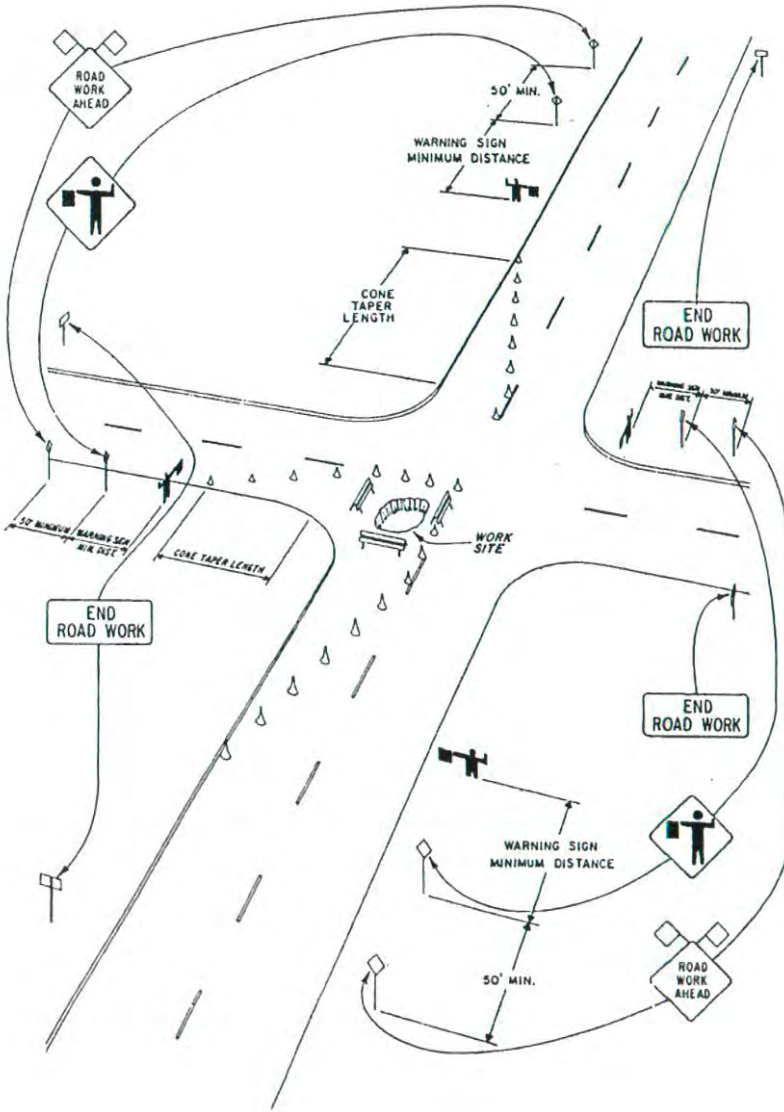




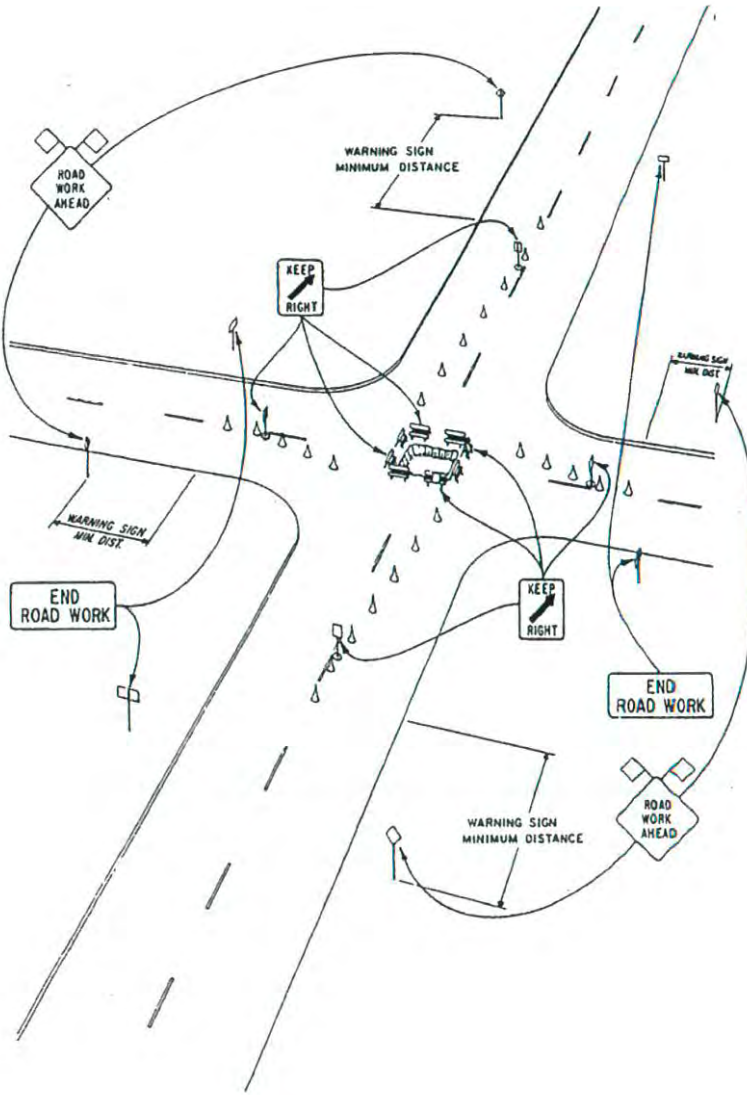
TYPICAL HALF ROAD CLOSURE
4-LANE DIVIDED



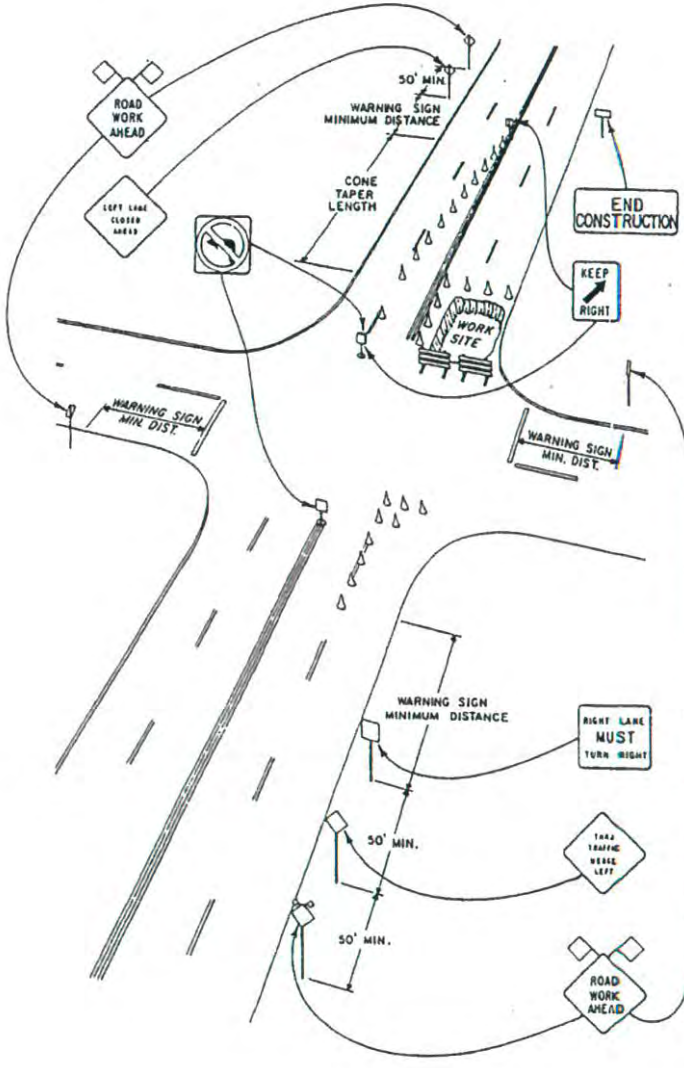
TYPICAL INSIDE LANE CLOSURE
WITH LEFT TURN BAY
4-LANE DIVIDED



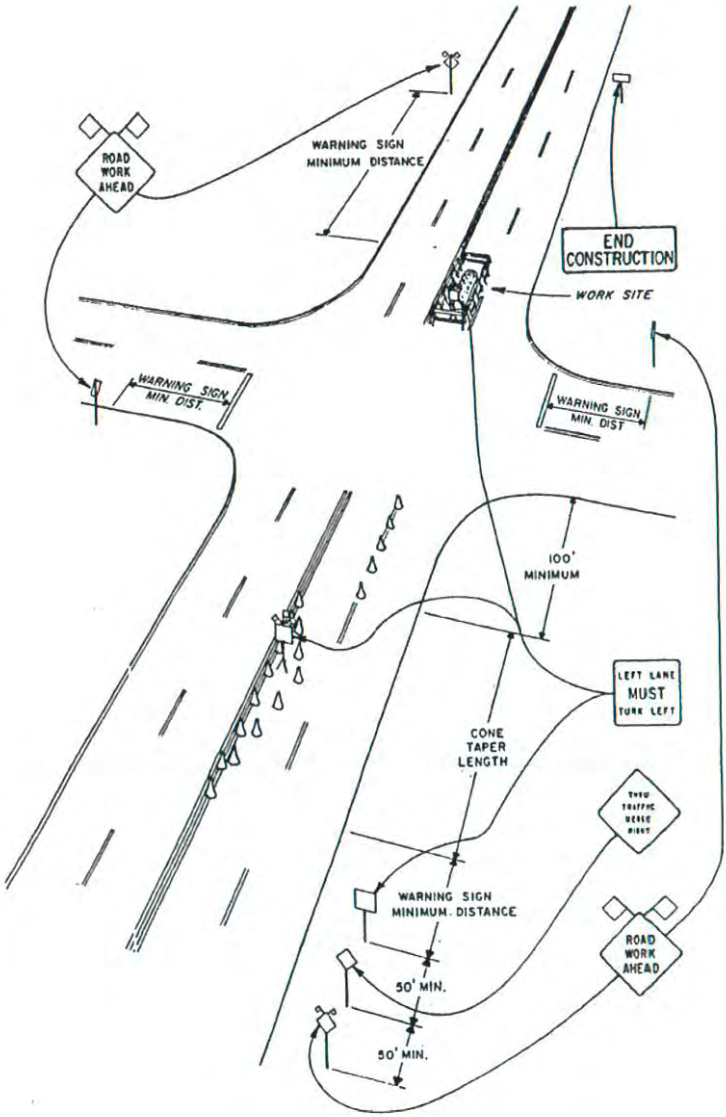
TYPICAL FLAGGER CONTROL
FOR INTERSECTION CLOSURE



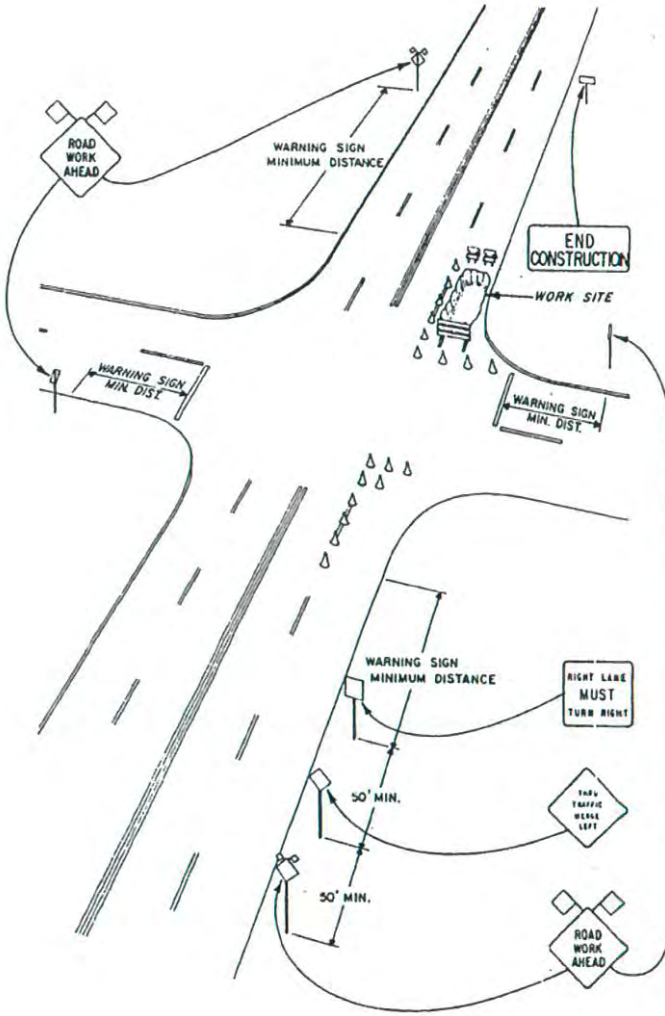
TYPICAL LANE CLOSURE
IN CENTER OF INTERSECTION



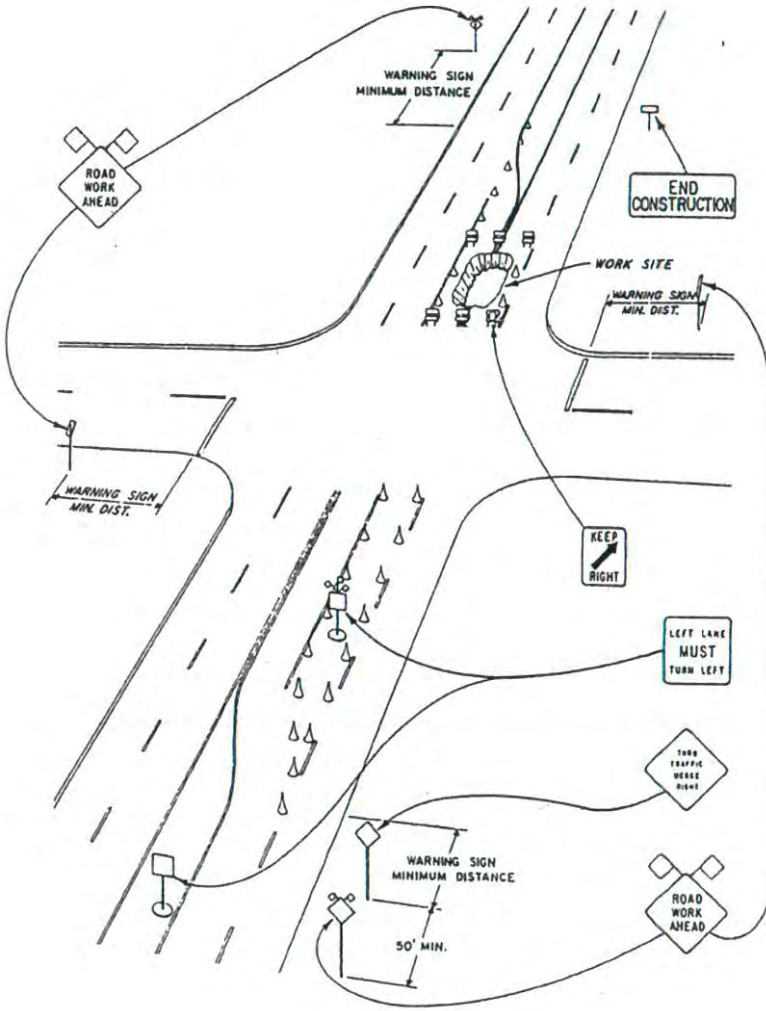
TYPICAL CLOSING HALF OF A 4-LANE STREET
FAR SIDE OF INTERSECTION



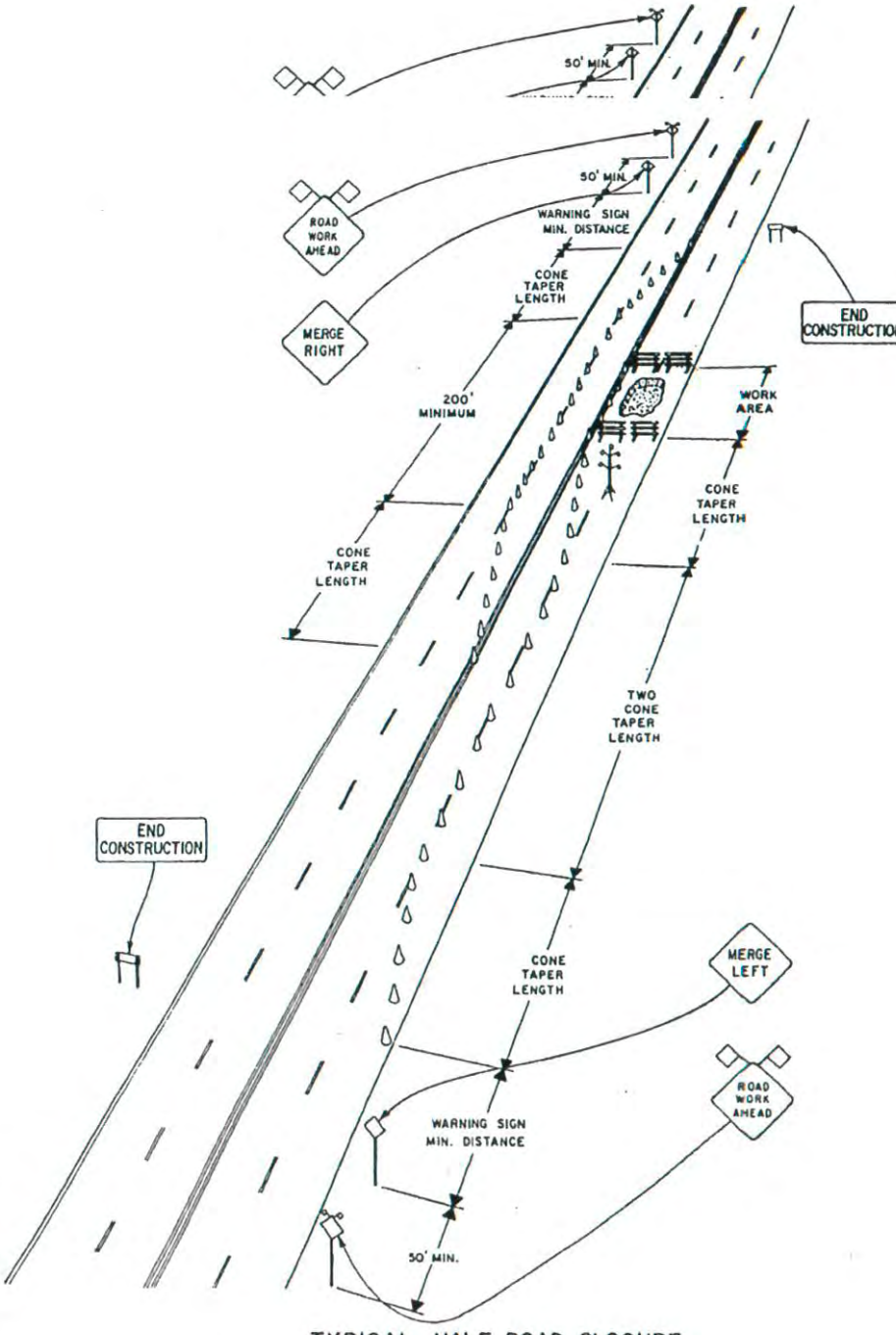
TYPICAL INSIDE LANE CLOSURE
FAR SIDE OF INTERSECTION
LEFT TURN PROVIDED



TYPICAL OUTSIDE LANE CLOSURE
FAR SIDE OF INTERSECTION



TYPICAL 2-LANE FARSIDE CLOSURE
WITH LEFT TURN LANES



TYPICAL HALF ROAD CLOSURE
4-LANE UNDIVIDED

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