GUARDING WORK AREAS

Contents

1. GENERAL

1.01 This section is a complete revision covering the use of Standard Warning Devices for guarding work areas in the Pacific Company. The devices are described and illustrated in Sections 081-200-920PT and 620-135-100. Warning devices are used for the purpose of providing maximum protection to Craftsmen, plant, equipment, and to the public, with minimum interference to vehicular and pedestrian traffic.

1.02 Advance consideration must be given to the protection of telephone company personnel and the general public at all work locations by providing planned protected work areas and traffic guidance.

1.03 Local laws and ordinances pertaining to traffic control, warning signals, flashers, guards, and similar devices must be complied with. It is good practice to notify local law enforcement officials where a minor traffic dislocation is involved. Where a major traffic dislocation will occur, such as blocking a traffic lane on a highway or a main traffic artery within a town, the law enforcement agency having jurisdiction should be consulted before work is begun.

1.04 In guarding work areas, especially those exposed to vehicular traffic, it is always preferable to provide more protection than may appear necessary rather than to underprotect.

1.05 It is impractical, if not impossible, to cover every situation that may be encountered which will require the use of warning devices. This practice covers typical examples that will illustrate the principles to be employed in providing the most effective protection to craftsmen, equipment, and the general public.

1.06 Initial warning devices for traffic control should be placed sufficiently ahead of the work area to give the motorist sufficient time to stop if necessary before reaching the work area. Recommended distances for placing initial warning signs ahead of the work area (Fig. 1) and

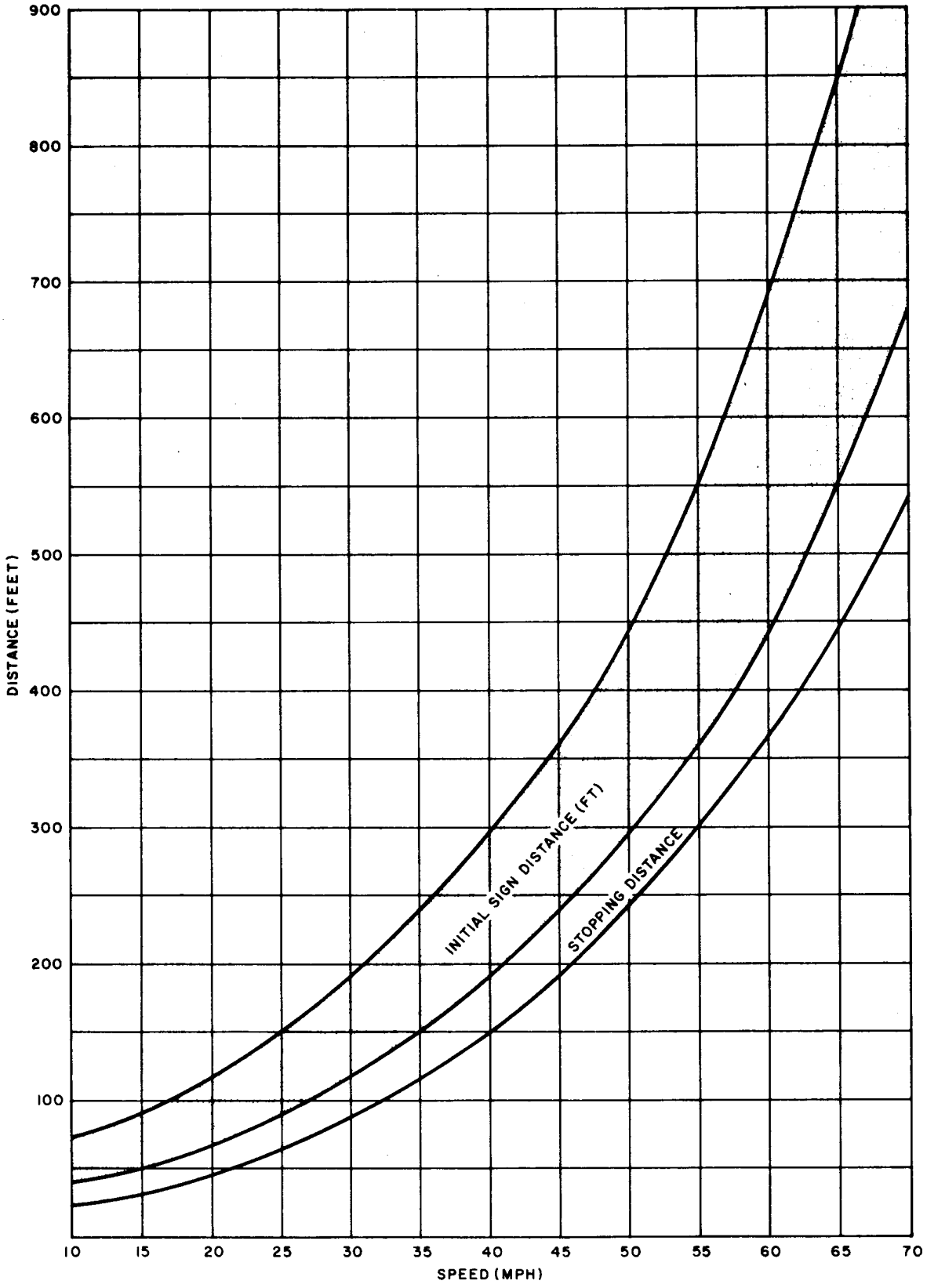


Fig. 1 - Placement of Initial Warning Signs

traffic cone spacing for various speed limits are listed in Table A.

TABLE A – SPACING FOR INITIAL WARNING SIGNS AND CONES

NOMINAL TRAFFIC SPEED (MPH)	INITIAL SIGN DISTANCE (FEET)	CONE SPACING (FEET)
15 or below	50-90	10
25	90-150	20-25
35	150-240	30-40
45	240-360	40-50
55	360-550	50-60
65 or above	550-850	60-75

1.07 The spacing of traffic warning cones is also dependent on normal traffic speeds. Where normal traffic speeds are less than 15 miles per hour, the maximum distance between cones should be about 10 feet. Where normal traffic speeds are in excess of 15 miles per hour, it is suggested that the maximum spacing in feet be approximately that of the allowable speed limit in miles per hour. As an example, if the speed limit is 50 miles per hour, the cones should be spaced at intervals of about 50 feet. More cones should be used particularly at the work location to "round off" the traffic channel and to clearly define the work area.

1.08 If available, a motor vehicle equipped with approved flashers and/or rotating beacons will serve as an effective barrier to vehicular traffic. These lights should be used day and night while the vehicle is used as a barrier. The vehicle should be placed between the work area and the oncoming traffic and should have the brakes set and the transmission engaged in **reverse gear.** During hours of darkness, vehicles used as barricades **shall be lighted by floodlights.** Under some extremely hazardous conditions, it may be desirable to use more than one vehicle to adequately guard the work area.

1.09 Where a vehicle is used for this purpose, there are a number of factors to be considered in determining which direction the truck should be faced, i.e., toward oncoming traffic or in the same direction as the traffic flow. Headlights should be off when facing oncoming traffic. The principal concern is to afford maximum protection to the craftsman. Some of the factors to be considered are:

(a) Requirements of local laws and regulations.

(b) Location of work areas to be protected with respect to traffic flow. For example, when oncoming drivers cannot observe the protected work area for a reasonable distance, facing the work vehicle in the same direction as the oncoming traffic may avoid possible confusion to a driver suddenly approaching a vehicle facing in the opposite direction from the normal traffic flow.

(c) Amount of equipment, tools, and materials which must be unloaded from the bed and side boxes of the truck.

(d) Location of materials and work space on the particular type of truck.

(e) Amount of work which **must** be done at the side or rear of the vehicle.

(f) Safety considerations and difficulty in turning the truck around to face oncoming traffic.

1.10 When a vehicle is used in guarding a work area, it should be considered supplemental to all other warning devices necessary to adequately safeguard the area and not as a substitute for any device. In this way, the work area is protected should it be necessary to remove the vehicle.

1.11 In addition to the warning devices illustrated in Fig. 2 through 23, it may be desirable to use high-intensity warning flashers with the high level warning equipment, both day and night. (Sections 620-135-100 and 081-200-920PT.)

2. PRECAUTIONS

2.01 **To ensure maximum safety, continued alertness is required** to supplement the best warning devices available. For example, the noise caused by a car out of control striking a distant warning device may give an alert craftsman sufficient time to get in the clear.

2.02 Carefully observe all moving traffic and exercise extreme caution when placing warning devices.

2.03 Place warning devices before positioning work equipment or starting work. Warning devices are employed to direct the motorist around the work area. Place warning devices in the traffic lane in which work is to be performed, and sufficiently far away to permit the approaching motorist to adjust his speed and course to avoid accidents. The first device a motorist observes should be the high level warning equipment. Remove all devices as soon as work has been completed.

2.04 Keep all warning devices clean and in good condition. Place the devices on the truck so that they will not be damaged by

contact with tools or materials. Carefully store warning flags when not in use. Dirty, torn, faded, or damaged flags should be replaced.

2.05 Make every effort to minimize the exposure time of craftsmen and others to possible danger. **All discussions and planning should take place off the street or highway; not in traffic lanes.**

2.06 Adjust the height of the high level warning equipment so that visibility will not be impaired or obstructed by trees, shrubbery, parked cars, or moving traffic. Where necessary, two or more high level warning devices equipped with flags and/or flashers may be used at different levels for maximum visibility.

2.07 Where a motorist cannot see the work area from the vicinity of the initial warning sign because of hills, curves, or other obstructions, place a high level warning with flags and/or high intensity flashers at this location. This is in addition to those placed at the actual work location.

2.08 Place floodlights, when used, so that they will not cause a glare in the eyes of approaching motorists.

2.09 Inspect all displayed warning flags from time to time to be sure that they are not wrapped around their supports.

2.10 Inspect all displayed flashers from time to time to see that they are still operating at the proper flashing rate of 75 to 95 flashes per minute. A slower rate usually indicates that batteries require changing. The flashing rate has been set by the manufacturer; do not attempt to make adjustments in the field.

2.11 Set up warning devices in a manner that does not create a hazard for pedestrians.

2.12 When working on private property, in pedestrian lanes, or on parkways, close all holes in the earth either temporarily or permanently, if feasible, before leaving the location. If this is impractical, fence the area with a snow-fence or equivalent, or place a watchman on duty to prevent small children or animals from falling into the excavation. Such fencing or guarding may be in addition to, or part of, the normal warning devices used at the location.

2.13 Rope off all work areas with barricade tape or equivalent, if practical.

2.14 Place tape or equivalent to designate a safe pedestrian walkway around obstructions such as ditches, holes, tool carts, or piles of dirt that may occur on busy sidewalks.

2.15 Only amber color (yellow) lenses shall be used in flashers. Flashers shall be used between sunset and sunrise and on dark days when required.

2.16 If manhole guards or barricades are to be temporarily stored near the work location after a day's work, secure them to a post, pole, or trailer where they will be least likely to cause interference. Do not secure manhole guards or barricades to fire hydrants or to poles having fire, police, or emergency call boxes.

2.17 Spread sand or salt on icy pavement in the traffic approach lane near the work area to provide increased traction for approaching motorists who may have to stop.

2.18 Use additional warning devices in locations such as crowded streets, dangerous intersections, and heavily-traveled highways. If placing of additional devices will not afford adequate protection, or if the use of sufficient warning devices is not practical, station a flagman at a location that will permit traffic to be given sufficient warning. The flagman must be constantly alert, and equipped with an approved warning device. A flagman should not be used at night unless absolutely necessary, or unless required by state or local regulations. If a flagman is used, he should be illuminated with a floodlight, and should wear highly visible clothing.

3. JOB PRESURVEY

3.01 A suitable plan for guarding the work area should be developed before work in the area is begun. This may be accomplished during the job site visit provided for in the Construction Control Plan. At busy intersections in highways and city streets or at other heavy traffic locations, the supervisor should presurvey the work location and then discuss the protection plan with the craftsman before work is started.

3.02 After completing the plan for the setup of warning devices for a particular location, analyze the plan from the point of view of the motorist and the pedestrian.

3.03 Check to see that all warning devices are in working condition and that any required supplemental devices are on the truck before leaving the storeroom or garage for the work location.

3.04 The following checklist will be helpful in planning for guarding the work area before starting work.

- Speed of traffic?
- Light or heavy traffic?
- Will nature of traffic change while work is being done?
- Are barricades required?

- Are flashers and/or floodlights required?
- Will flagman be required when setting up and removing warning devices? During work operation?
- Will the established plan comply with state and local laws and regulations?
- Is permit required?
- Are police notified?
- On routes to or near special events such as ballgames, racetracks, etc., can job be scheduled on days or hours with least traffic?
- Where can required tools, materials, and equipment be kept during work operations? After working hours?
- Where will pump, blower, and lighting equipment be placed with respect to work location?
- Will work operation cause interference to pedestrian or vehicular crossing, such as school crossing or bus stop?
- Can warning devices be placed in traffic lane or lanes in which manhole is located?

4. HIGHWAYS

4.01 **Two-Lane Highway:** Where the work area is located near the center of a two-lane highway, place warning devices as illustrated in Fig. 2. If one lane of a two-lane highway is blocked, one or more flagmen shall be used.

4.02 **Three-Lane Highway:** Where the work area is located in the outside lane of a three-lane highway, place warning devices as illustrated in Fig. 3.

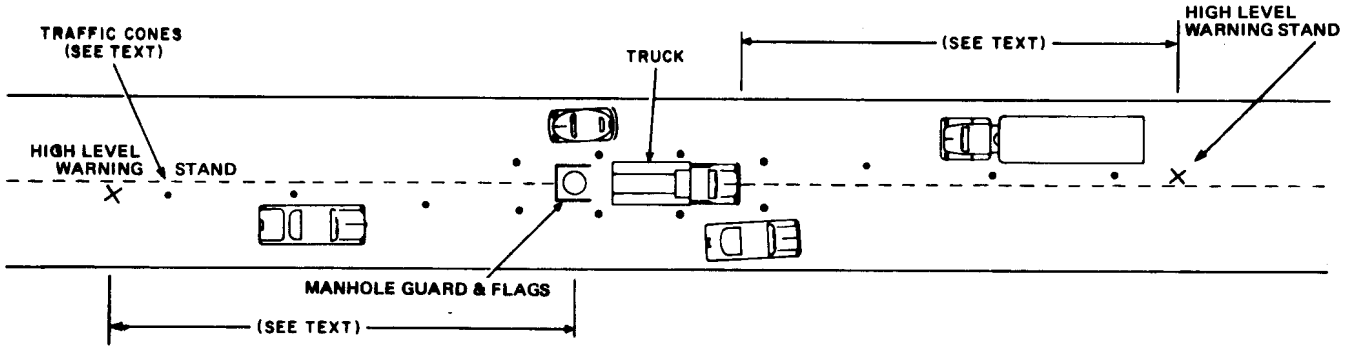


Fig. 2 - Placement of Warning Devices on Two-Lane Highway - Underground Plant Near Center of Highway

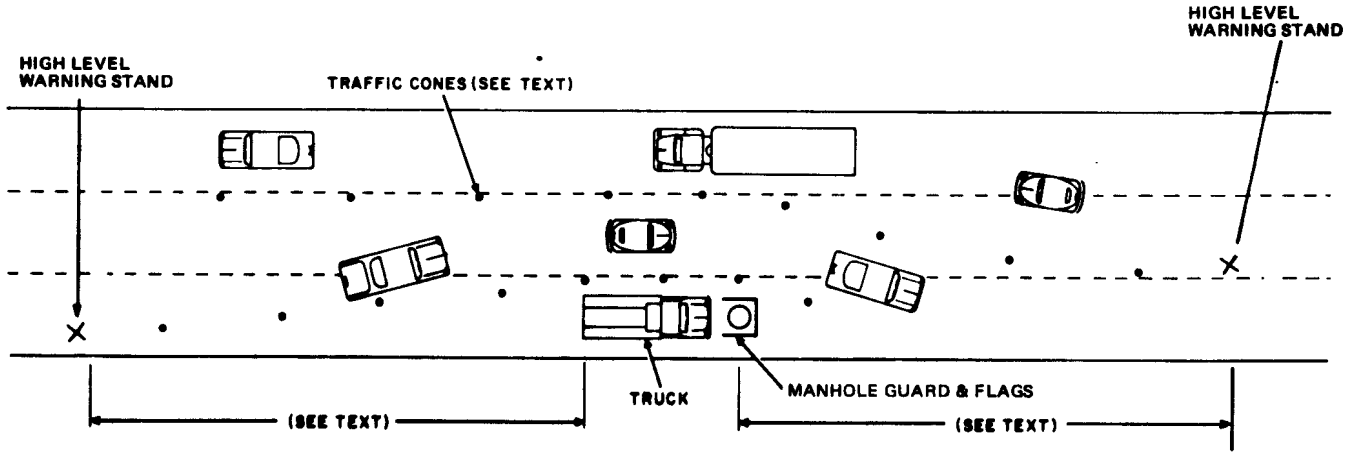


Fig. 3 - Placement of Warning Devices on Three-Lane Highway - Underground Plant in Outside Lane

4.03 Where the work are is located in the center lane of a three-lane highway, place warning devices as illustrated in Fig. 4.

4.04 Where the work area is located between two lanes of a three-lane highway, place warning devices as illustrated in Fig. 5.

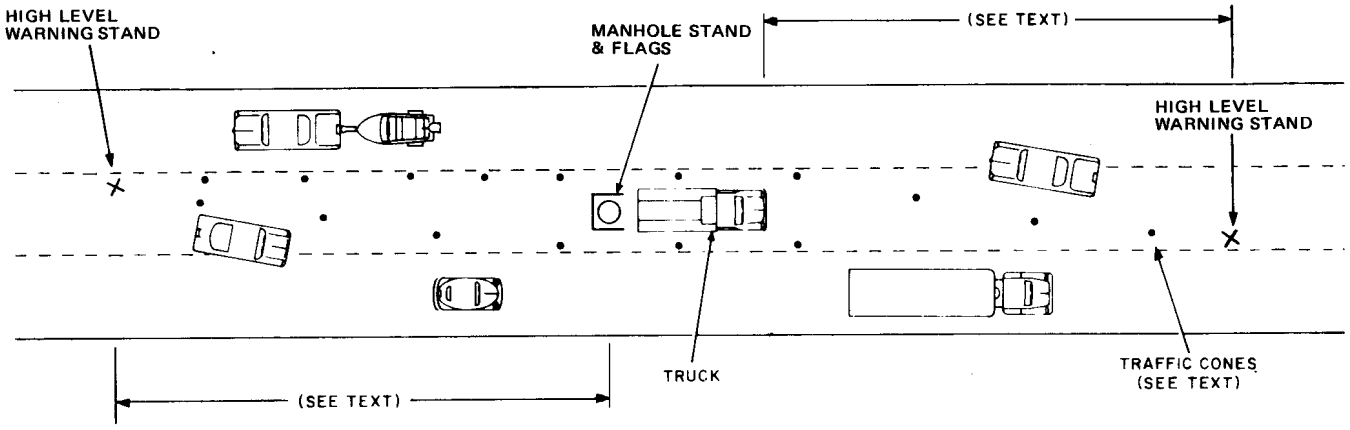


Fig. 4 - Placement of Warning Devices on Three-Lane Highway - Underground Plant Near Center of Highway

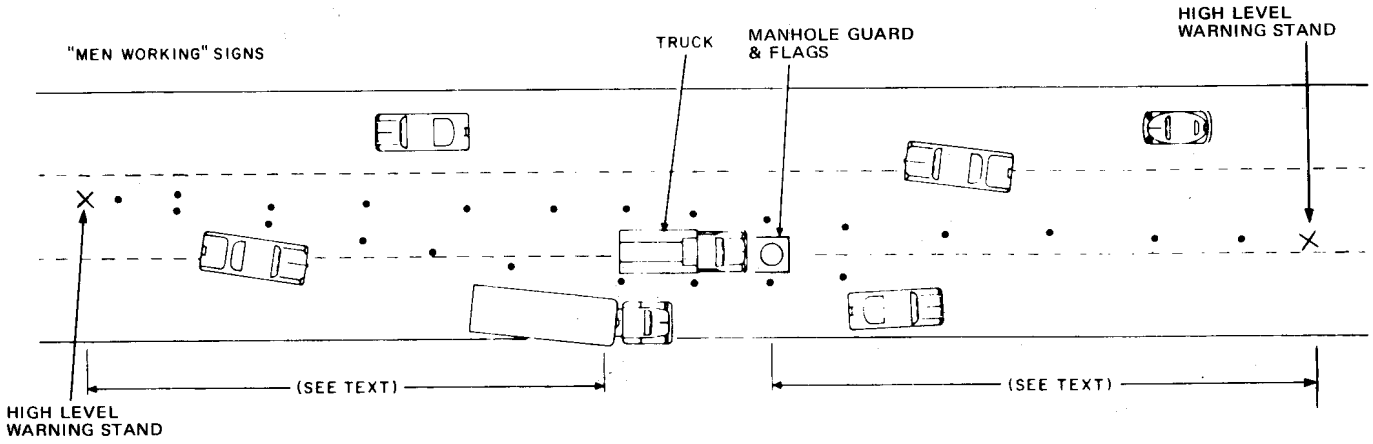


Fig. 5 - Placement of Warning Devices on Three-Lane Highway - Underground Plant Between Two Lanes

4.05 **Four-Lane Highway:** Where the work area is located in an inside lane of a four-lane highway, place warning devices as illustrated in Fig. 6.

4.06 Where the work area is located in an outside lane of a four-lane highway, place warning devices as illustrated in Fig. 7.

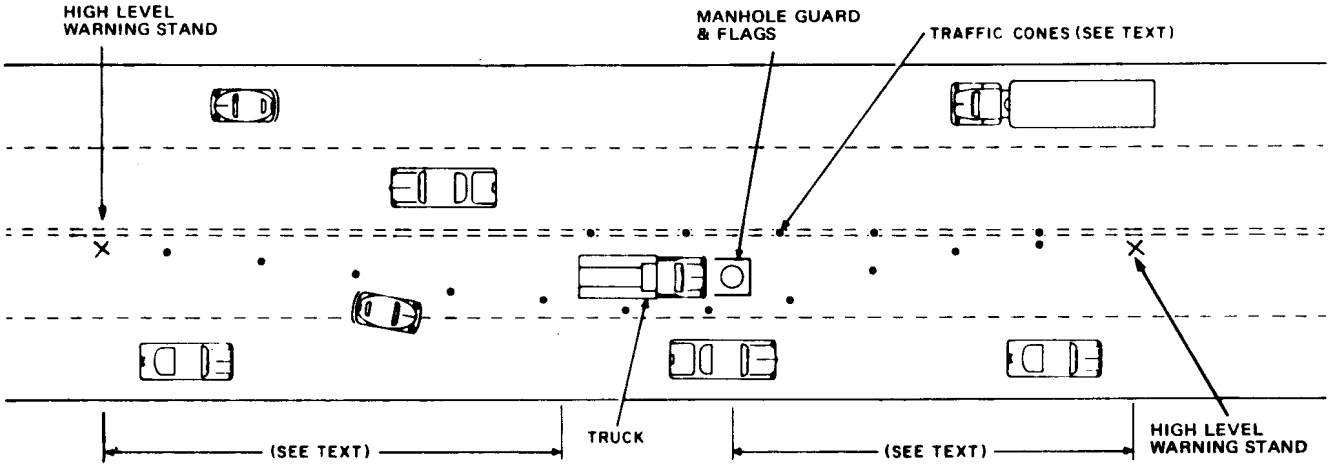


Fig. 6 - Placement of Warning Devices on Four-Lane Highway - Underground Plant in Inside Lane

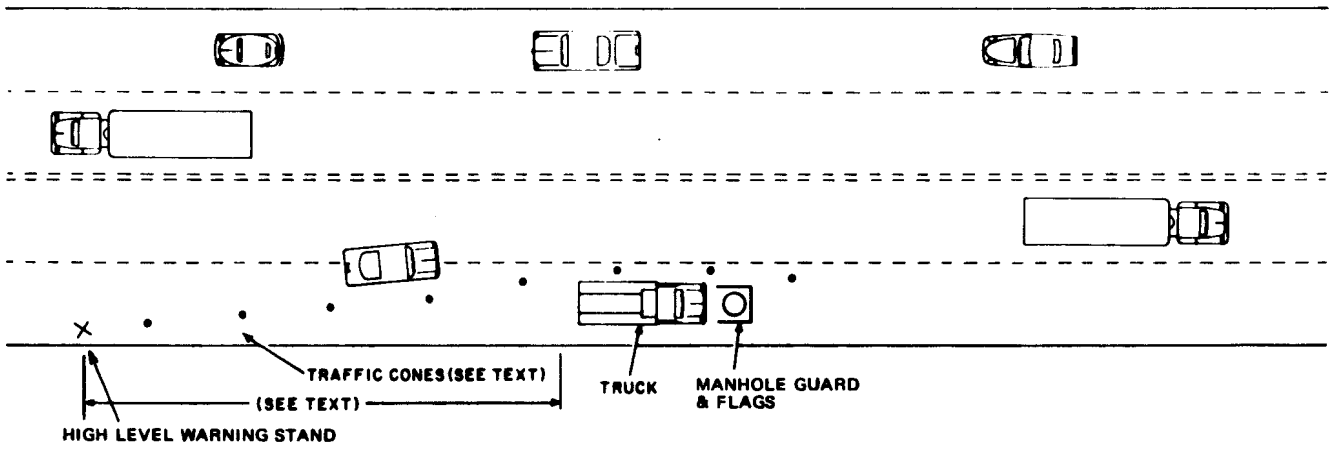


Fig. 7 - Placement of Warning Devices on Four-Lane Highway - Underground Plant in Outside Lane

4.07 Where the work area is located between inside and outside lanes of a four-lane highway, place warning devices as illustrated in Fig. 8.

4.08 **Divided Highway:** Where the work area is in a traffic lane of a divided highway, place warning signs according to the appropriate plan given in 4.05 through 4.07. When the work area is in a narrow median of a divided highway, place warning signs as illustrated in Fig. 9. If the median is wide and the work area is adjacent to one of the inside lanes, warning signs may only be necessary on one side of the highway.

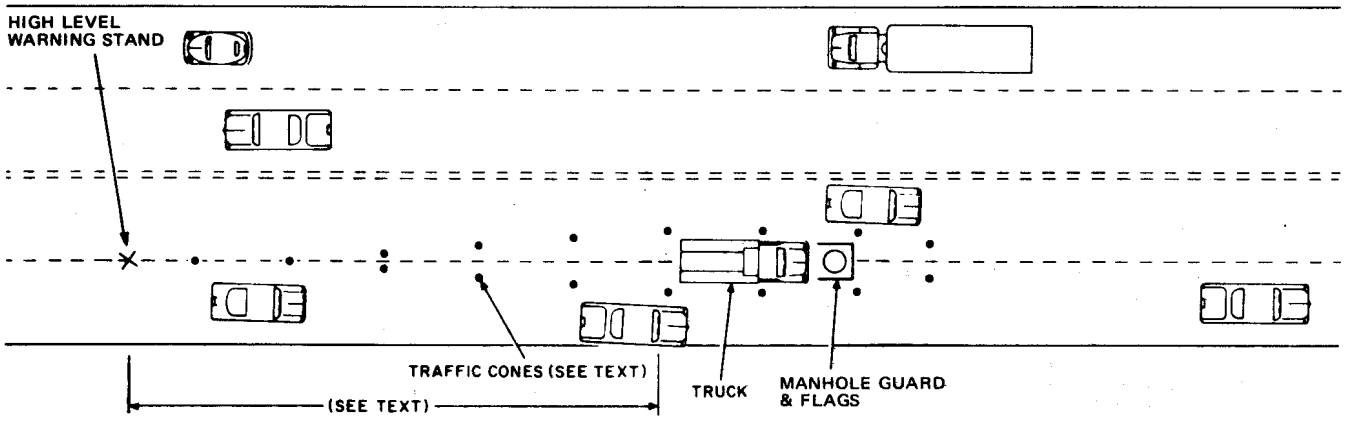


Fig. 8 - Placement of Warning Devices on Four-Lane Highway - Underground Plant Between Inside and Outside Lane

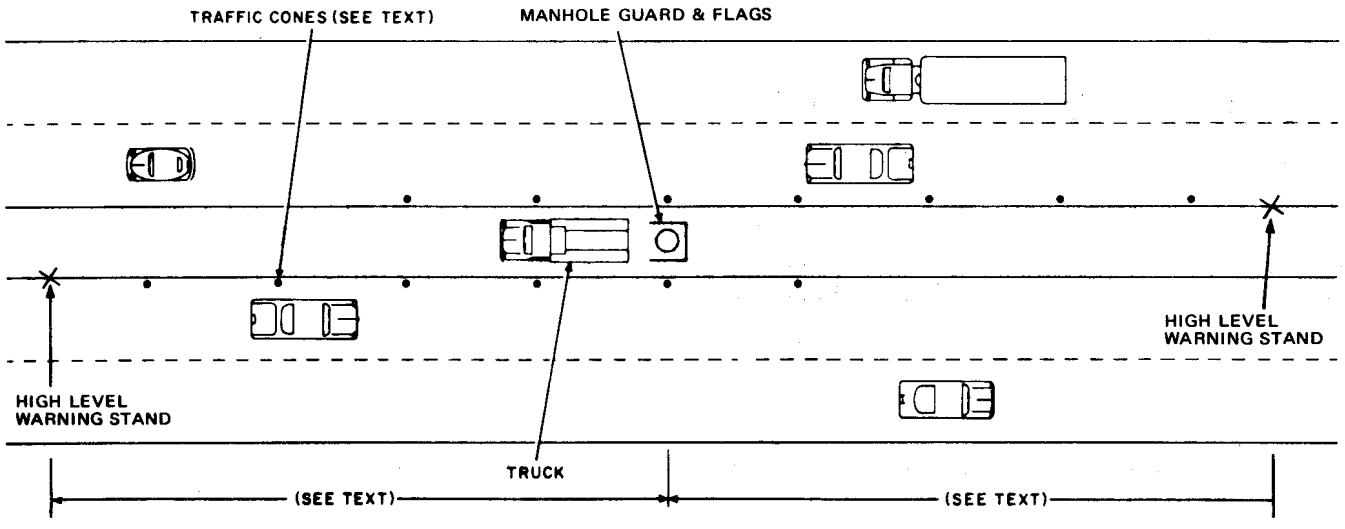


Fig. 9 - Placement of Warning Devices on Four-Lane Divided Highway - Underground Plant in Median

5. CITY STREETS AND ALLEYS

5.01 Where city streets are sufficiently wide to park a truck at the manhole, the plans for placing warning devices given in Part 4 may generally be used. Where a truck is not used, or cannot be used because the street is too narrow, place warning devices according to the following.

5.02 **City Street - Underground Plant:** Where the work area is near the center of a city street, place warning devices as illustrated in Fig. 10.

5.03 Where the work area is at the side of a city street, place warning devices as illustrated in Fig. 11. If vehicles are parked along the side of the street in the direction of approaching traffic, place initial warning sign and cones as for traffic under 15 miles per hour. If no vehicles are parked in the direction of approaching traffic, place initial warning sign and cones as normal traffic speed dictates. **Be alert for changing traffic conditions.**

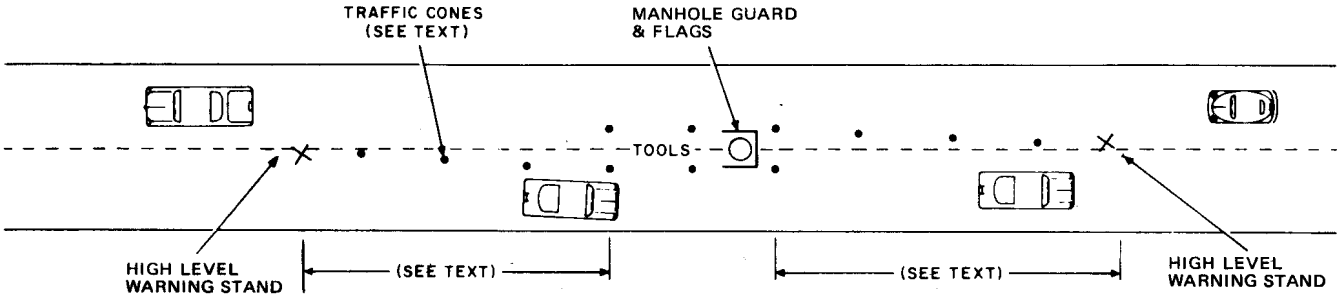


Fig. 10 - Placement of Warning Devices on City Street Without Truck - Underground Plant Near Center of Street

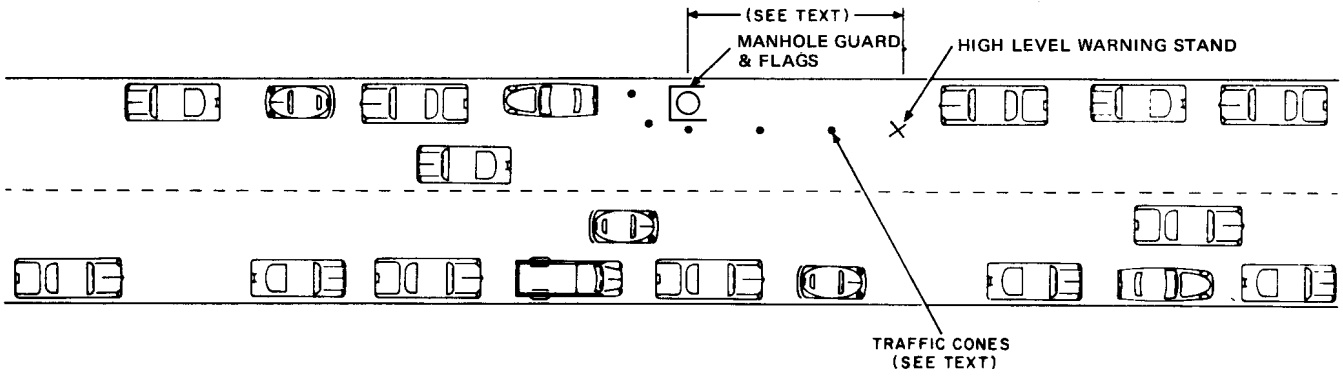


Fig. 11 - Placement of Warning Devices on City Street Without Truck - Underground Plant at Side of Street

5.04 Where the work area is near an intersection, place warning devices as illustrated in Fig. 12.

5.05 Where the work area is in an intersection, place warning devices as illustrated in Fig. 13.

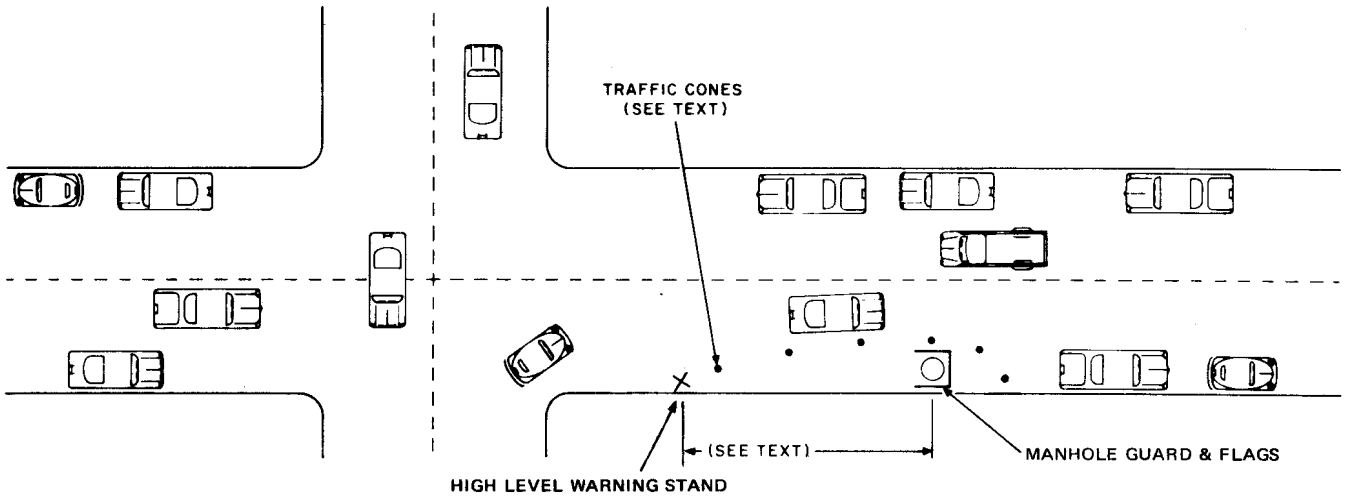


Fig. 12 - Placement of Warning Devices on City Street Without Truck - Underground Plant Near Intersection

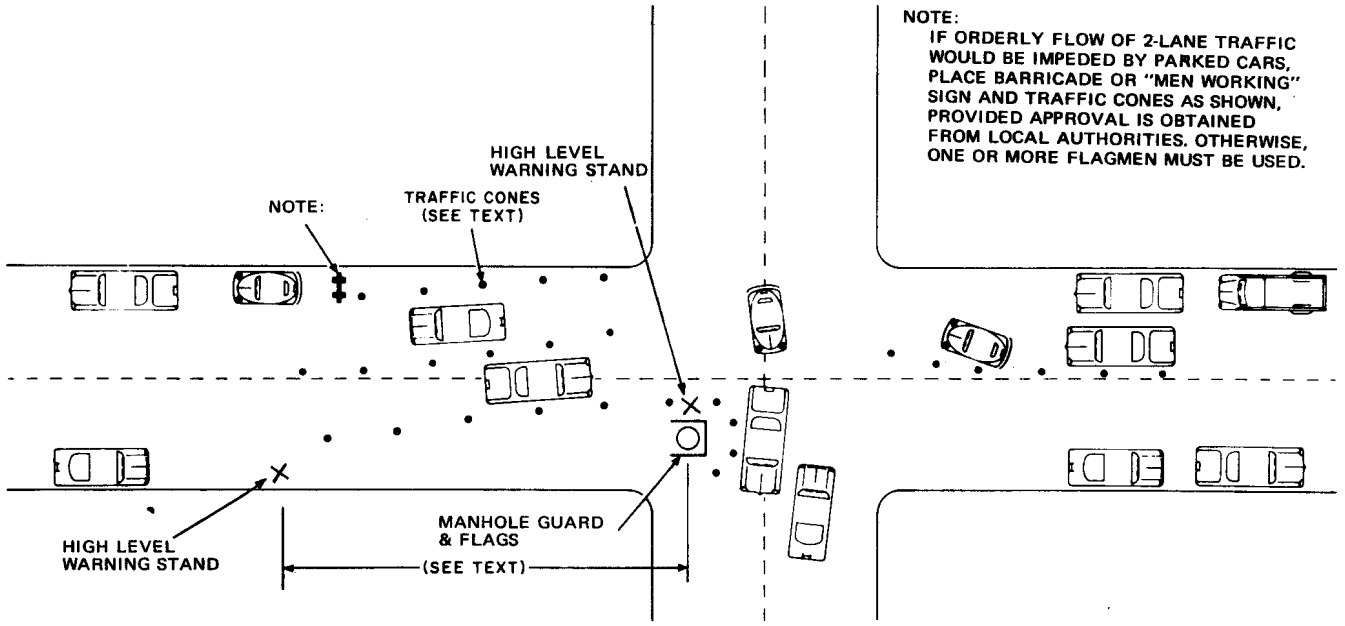


Fig. 13 - Placement of Warning Devices on City Street Without Truck - Underground Plant in Intersection

5.06 Where the work area is near an intersection of a city street, and the work operation requires an open trench, place warning devices as illustrated in Fig. 14.

5.07 **City Street - Aerial Plant:** Where aerial work is involved on city streets and a truck is used, place warning devices according to the following.

5.08 Where the work area is near an intersection of a city street, place warning devices as illustrated in Fig. 15.

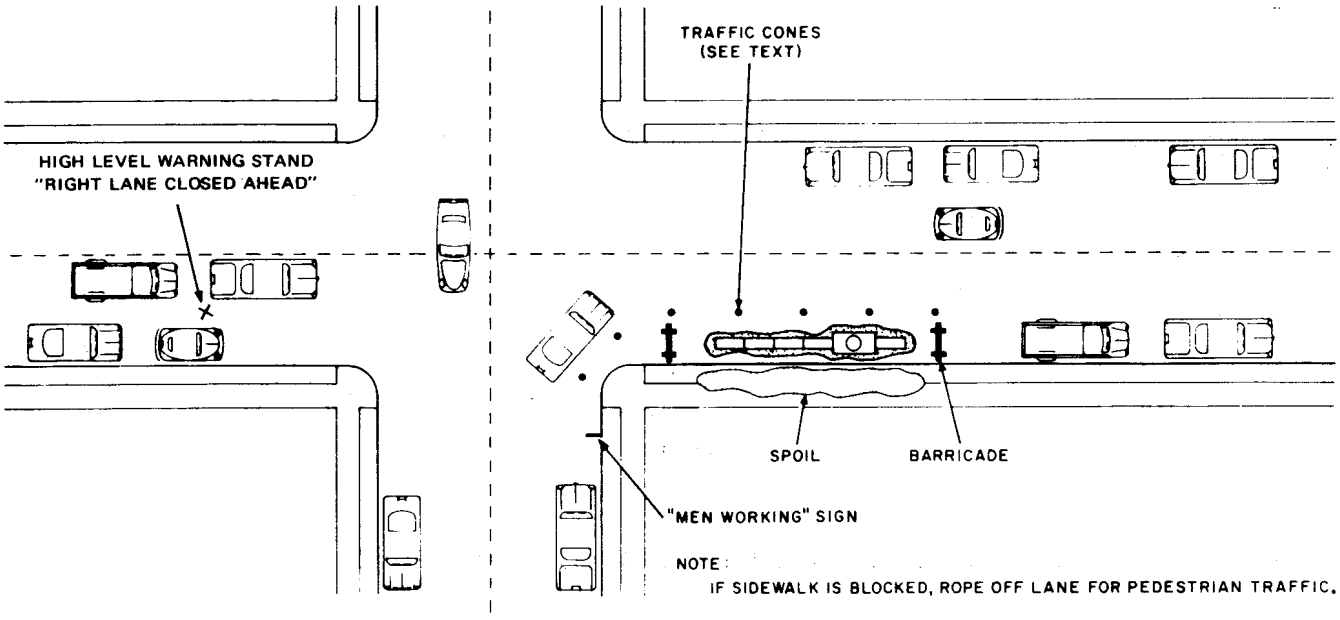


Fig. 14 - Placement of Warning Devices on City Street Without Truck - Opened Trench Near Intersection

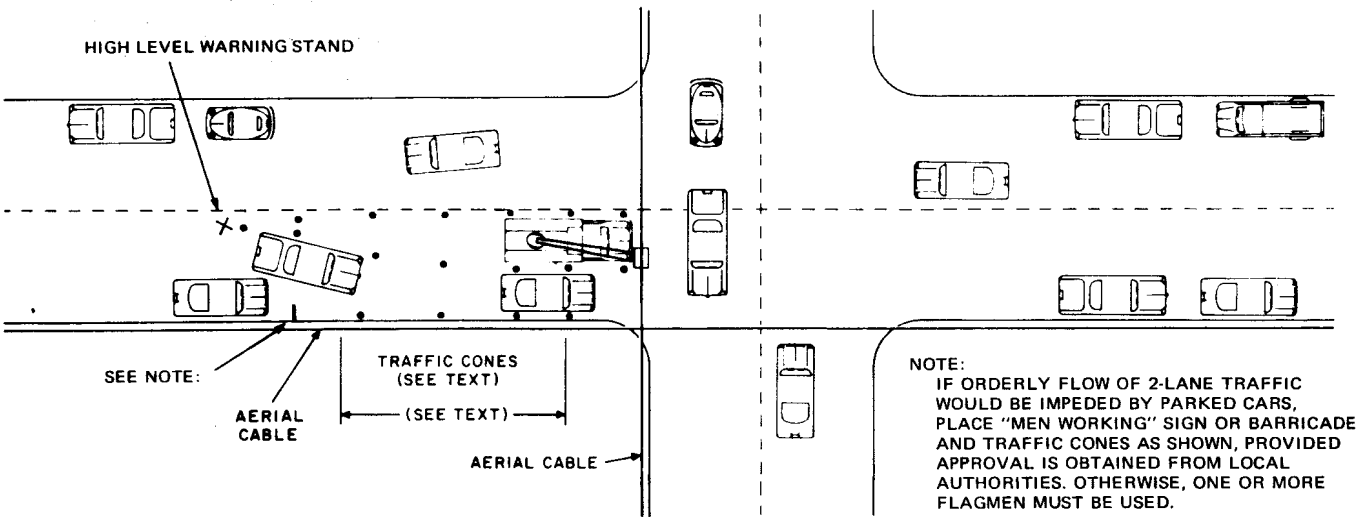


Fig. 15 - Placement of Warning Devices on City Street - Aerial Plant Near Intersection

5.09 When setting a pole at the side of a city street, place warning devices as illustrated in Fig. 16.

5.10 When placing a pole at the side of an alley, it will generally be necessary to block the alley to all traffic until the work is completed. Place warning devices as illustrated in Fig. 17.

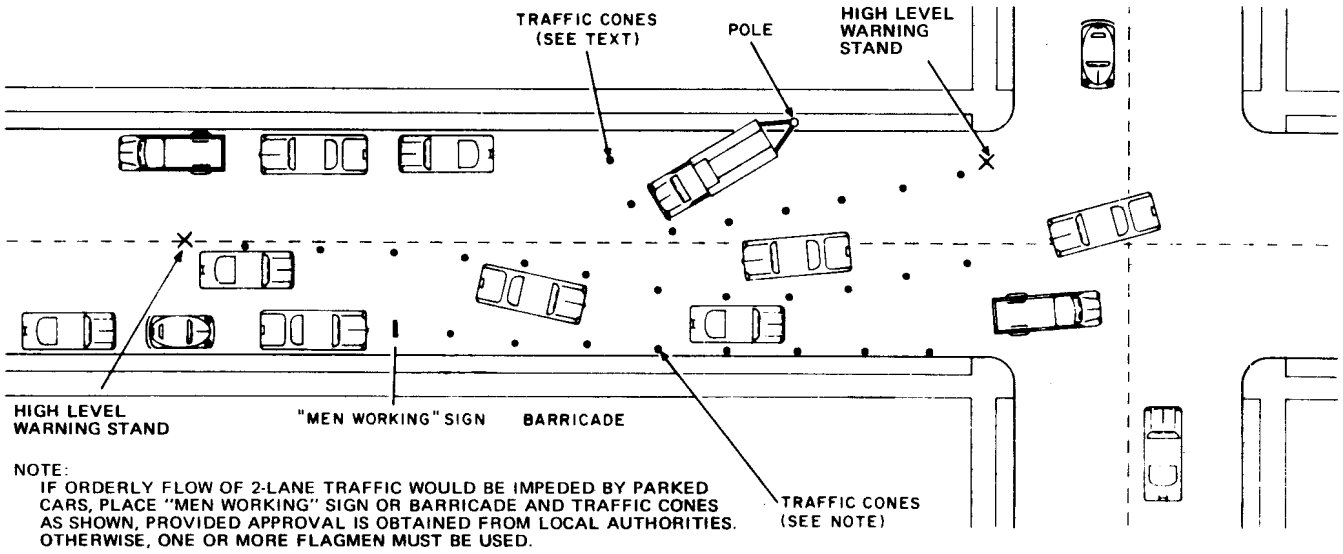


Fig. 16 - Placement of Warning Devices on City Streets - Setting Pole on Side of Street

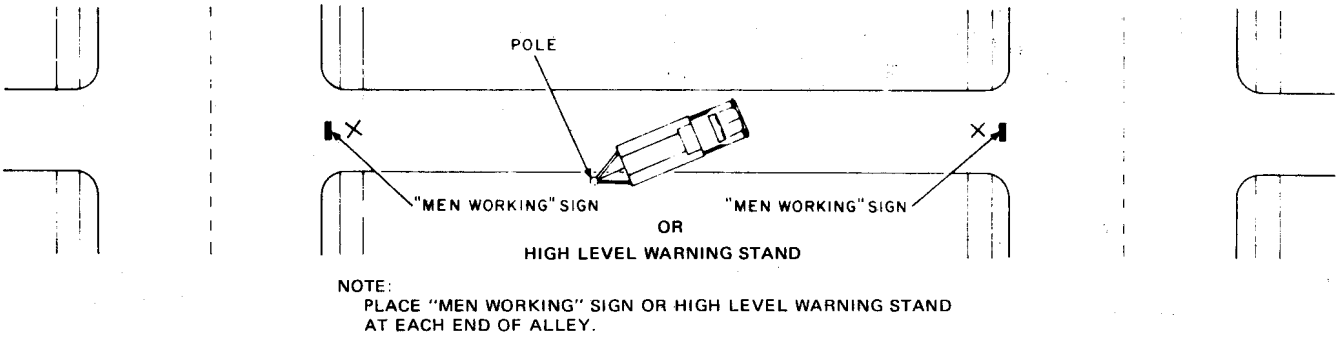


Fig. 17 - Placement of Warning Devices in Alley - Setting Pole in Alley

6. SHOULDER LOCATIONS

6.01 Guard all manholes or excavations on private property, pedestrian lanes, or parkways with barricades or manhole guards equipped with warning flags and signs. Rope off pedestrian lanes with barricade tape and prominently display warning flags and signs.

6.02 **Manhole on Highway Shoulder:** Where the work area is on the shoulder of a two- or three-lane highway, place warning devices as illustrated in Fig. 18. On four-lane or divided highways, omit warning signs on side of highway opposite the work location.

6.03 **Buried Cable on Highway Shoulder:** When burying cable or wire on a shoulder adjacent to a highway, place warning devices as illustrated in Fig. 19. Backfill as soon as practical to minimize the time the trench is open.

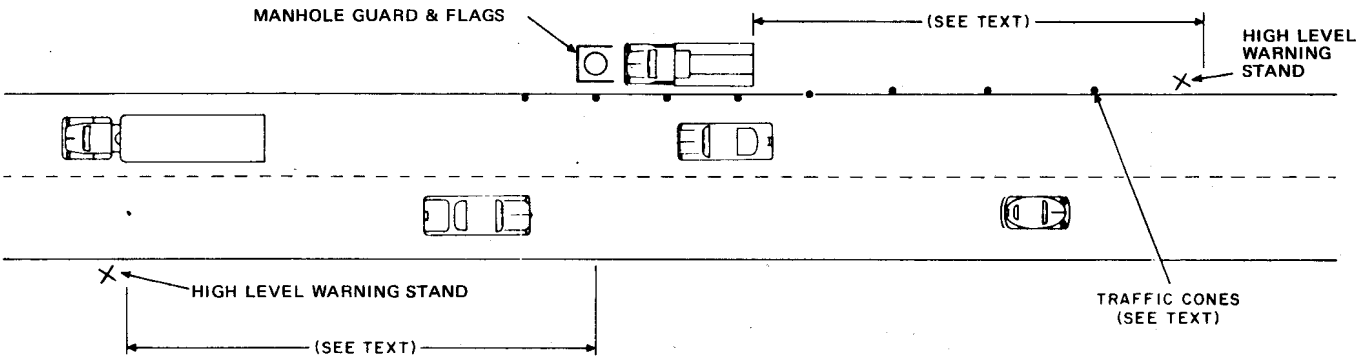
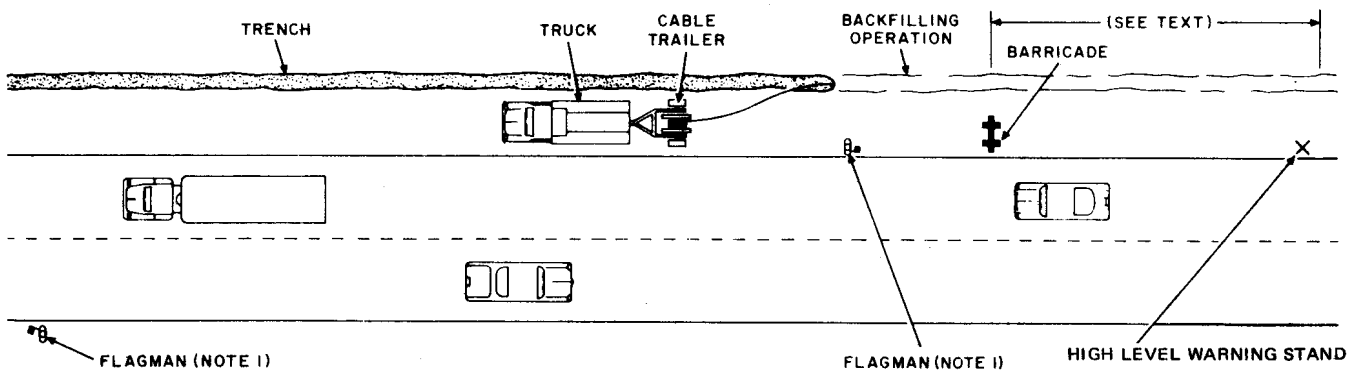


Fig. 18 - Placement of Warning Devices on Street or Highway - Underground Plant on Shoulder



NOTES:

1. PLACE FLAGMAN BEHIND CABLE TRAILER APPROXIMATELY 50 FEET; PLACE FLAGMAN ON OPPOSITE SIDE OF HIGHWAY APPROXIMATELY 200 FEET AHEAD OF TRUCK IF DEEMED NECESSARY.
2. AS OPERATIONS PROCEED ADD ADDITIONAL WARNING DEVICES AS REQUIRED. AS BACKFILLING IS COMPLETED, MOVE BARRICADE, HIGH LEVEL WARNING, AND FLAGS FORWARD.

Fig. 19 - Placement of Warning Devices on Street or Highway - Underground Cable Placing on Shoulder

6.04 **Aerial Cable on Highway Shoulder:** When aerial cable is being maintained on a highway shoulder, place warning devices as illustrated in Fig. 20.

6.05 When aerial cable is being placed on a highway shoulder, place warning devices as illustrated in Fig. 21.

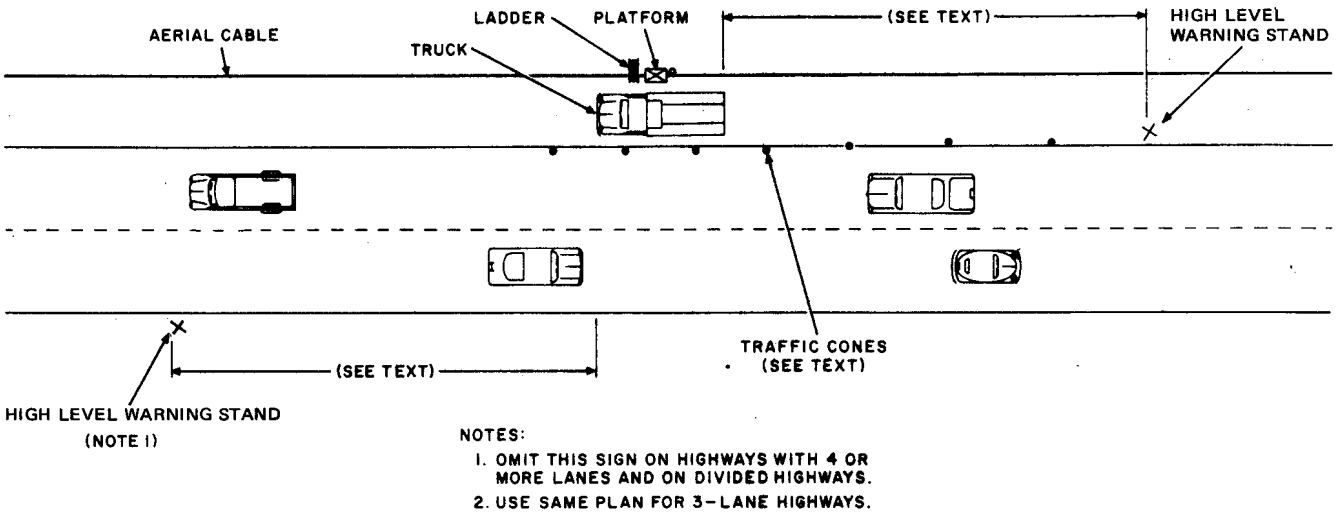


Fig. 20 - Placement of Warning Devices on Street or Highway - Aerial Plant on Shoulder

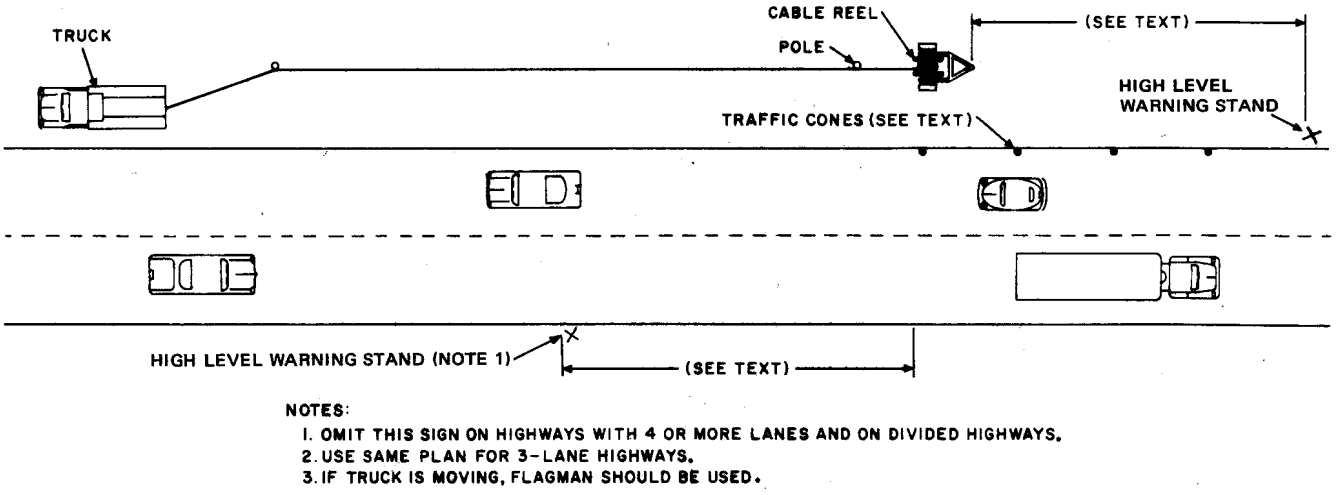


Fig. 21 - Placement of Warning Devices on Street or Highway - Stringing Aerial Cable on Shoulder

7. DURING HOURS OF DARKNESS

7.01 On dark days or during hours of darkness, additional warning devices are generally required:

(a) Place flashers at the work location to warn traffic approaching from all directions that have been marked by initial warning signs.

(b) All flashing lights used as warning devices shall be amber or yellow colored. Flashers shall not be used for delineating the path traffic is to follow.

(c) Where high level warning equipment is located at the initial warning location because of hills or curves, equip the unit with a flasher.

(d) Use floodlights to illuminate the work area. Place the lights so that they will adequately light the work area, but will not cause a glare in the eyes of oncoming motorists approaching from any direction.

7.02 **Underground Plant in Three-Lane Highway:** Where the work area involves underground plant located in the center of a three-lane highway at night and a truck is employed, place warning devices as illustrated in Fig. 22.

7.03 **Underground Plant in Two-Lane Highway:** Where the work area involves underground plant located in a two-lane highway at night and a truck is not employed, place warning devices as illustrated in Fig. 23.

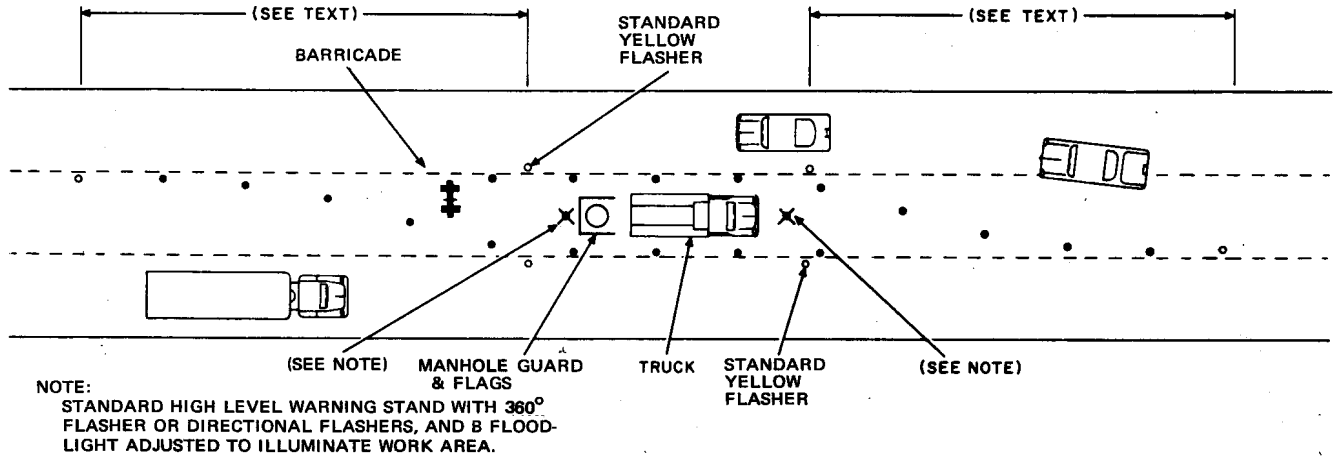


Fig. 22 - Placement of Warning Devices on 3-Lane Highway at Night With Truck - Center Lane Blocked - Underground Plant Near Center of Highway

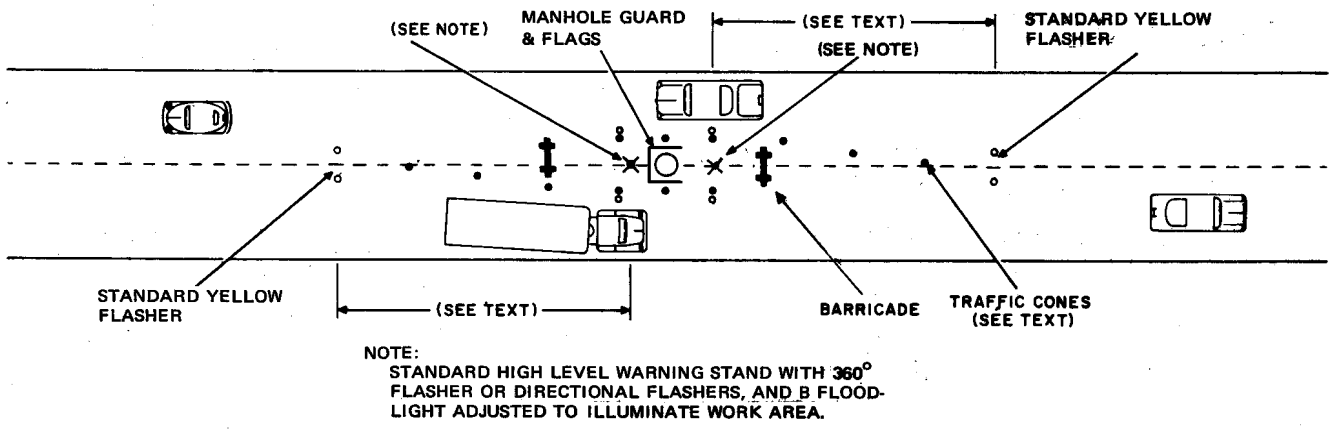


Fig. 23 - Placement of Warning Devices on 2-Lane Street or Highway at Night Without Truck - Underground Plant Near Center of Highway