

## SECTION 645 - TRAFFIC CONTROL DEVICES

Make the following amendments to said Section:

(I) Amend the title to read as "**SECTION 645 - WORK ZONE TRAFFIC CONTROL**"

(II) Amend Table 645-I - For Traffic Control Plan to read as follows:

| TABLE 645-I - FOR TRAFFIC CONTROL PLAN |                                  |                            |                              |  |   |         |              |
|--|----------------------------------|----------------------------|------------------------------|--|---|---------|--------------|
| POSTED<br>SPEED<br>LIMIT<br>(M.P.H.)   | SIGN<br>SPACING<br>(D)<br>(FEET) | TAPER LENGTH (T)<br>(FEET) |                              | LONGI-<br>TUDINAL<br>BUFFER<br>SPACE<br>(B) (FEET) | SPACING OF CONES OR<br>DELINEATORS (FEET) |         |              |
|  |                                  | W = 12' OR<br>LESS *       | W =<br>GREATER<br>THAN 12' * |  | TAPER                                     | TANGENT | WORK<br>AREA |
| 20                                     | 250                              | 200                        | W x 17                       | 35   | 20  | 20      | 10           |
| 25                                     | 250                              | 200                        | W x 17                       | 55   | 25  | 25      | 10           |
| 30                                     | 250                              | 250                        | W x 20                       | 85   | 30  | 30      | 10           |
| 35                                     | 250                              | 250                        | W x 20                       | 120  | 35  | 35      | 10           |
| 40                                     | 500                              | 350                        | W x 30                       | 170  | 40  | 40      | 10           |
| 45                                     | 500                              | 550                        | W x 45                       | 220  | 45  | 45      | 10           |
| 50                                     | 1000                             | 600                        | W x 50                       | 280  | 50  | 50      | 10           |
| 55                                     | 1000                             | 700                        | W x 55                       | 335  | 55  | 55      | 10           |
| * W = width of lane or shoulder        |                                  |                            |                              |  |   |         |              |

(III) Amend **645.03 Construction Requirements** by adding the following:

"The Contractor shall furnish the two Police Officers as part of the Contractor's traffic control work.

Traffic control devices including cones, barricades, warning signs with supports, lights, and temporary signals shall conform to 'The Hawaii Administrative Rules, Title 19, Subtitle 5, Chapters 127, 128 and 129', the MUTCD and Section 104 - Scope of Work. Reflectorization for protective devices such as cones, barricades, delineators, and signs, shall conform to Subsection 712.20 - Signs.

Do not use steel drums and steel barrels for traffic controls in construction and maintenance work zones.

As of 10/01/2000, all new barricades, signs with sign supports and vertical panels without lights shall require an FHWA approval letter certifying that the device is NCHRP Report 350 compliant. Do not use barricades, signs with sign supports, and other traffic control devices purchased before 10/01/2000 that are not certified to be NCHRP Report 350 compliant after 10/01/2003.

Upon request of the Engineer, furnish a self-certified NCHRP Report 350 compliant letter from the vendor for each type of single-piece traffic cone, single-piece drum, tubular marker and delineator.

**(A) Signs**

**(1) General.** Install signs ahead of the place where operations may interfere with the use of the road by traffic and at intermediate points where the new work crosses or coincides with an existing road.

Place such signs as specified by the contract and as specified and accepted by the Engineer.

Submit to the Engineer 8 sets of FHWA approval letter certifying that the signs and sign supports are NCHRP Report 350 compliant.

**(B) Barricades**

**(1) General.** Apply and install the barricades according to the contract.

Provide, erect, and maintain necessary barricades, suitable and sufficient lighting devices, signs and other traffic control devices, and precautions for the protection of the work and safety of the public

Protect roadways closed to traffic, illuminate obstructions during hours of darkness, and provide warning signs to control and direct traffic according to the contract.

Submit to the Engineer 8 sets of FHWA approval letter certifying that the barricades are NCHRP Report 350 compliant.

Barricades shall be in good condition. Submit barricades for acceptance by the Engineer for use within the project limits according to this section. Barricade application and installation shall be according to the contract and as specified by the Engineer.

Provide sand bags if required or specified by the Engineer. All sand bags and their method of installation shall comply with the MUTCD and be accepted by the Engineer prior to use. Do not place sand bags on the striped barricade rail.

Install steady burn and/or flashing lamps on selected barricades used during hours of darkness. Locations shall be according to the contract and specified by the Engineer. Attach the lamps on the barricade ends closest to the traveled way. Lamps shall be visible to the motorist.

Do not install signs on barricades unless the sign on barricade system has been crash tested, accepted under NCHRP Report 350, and accepted by the Engineer.

The Contractor may use the accepted barricades for temporary detours, construction phasing, or other temporary traffic control work.

The Contractor may use the accepted barricades used in temporary detours or construction phasing for permanent locations according to the contract.

Upon completion of the construction work, leave the barricades in place, relocate the barricades, or remove and dispose the barricades according to the contract or as specified by the Engineer. Barricades left in place or relocated to new permanent locations shall become the property of the State. Barricades removed and disposed of shall become the property of the Contractor.

**(2) Reflectorization.** Reflectorize barricade rails and the attachment with reflective sheeting according to Subsection 712.20(C)(4) - Type III or IV Retroreflective Sheeting (High or specified and accepted by the Engineer.

Reflectorize both vertical faces of each barricade rail according to the contract.

**(3) Color.** Rails, frames and braces shall be white. The front and back faces of barricade rails shall have 6-inch wide alternate colored and white stripes sloping downward toward the traveled way at an angle of 45 degrees with the vertical. The colored stripes shall be either orange or red according to the following requirements:

**(a)** Use orange and white stripes for construction, detour or maintenance work.

(b) Use red and white stripes on roadways with no outlet such as dead-ends and cul-de-sacs, ramps or lanes closed for operational purposes, or permanent or semi-permanent closure or termination of a roadway.

(4) **Maintenance.** Keep the barricades in good condition throughout their usage during construction.

(a) To maintain their effectiveness and appearance, repair, clean or replace the required barricades as specified by the manufacturer guidelines and as specified by the Engineer.

(b) Immediately replace lost, stolen or damaged barricades, lamps and sand bags.

Clean and repair the barricades used during construction phasing, temporary detours or other temporary traffic control work before relocating to permanent locations according to the contract or as specified by the Engineer.

The Engineer will not make payment for repair work or cleaning of barricades. The Engineer shall decide the suitable condition of each barricade and when each barricade needs repairing or cleaning.

(C) **Traffic Delineators.** Install traffic delineators to show the temporary alignment of detour roads according to the contract or as specified by the Engineer.

Upon request of the Engineer, submit to the Engineer an FHWA approval letter certifying that the device is NCHRP Report 350 compliant.

Maintain the traffic delineators and keep the traffic delineators clean and in good repair. Replace lost, stolen or damaged traffic delineators immediately.

At the end of a detour phase, relocate the traffic delineators and keep the traffic delineators clean and in good condition to the next detour phase. At the end of the construction period, leave in place or remove the traffic delineators according to the contract or as specified by the Engineer. The traffic delineators will become the property of the Contractor when no longer required on the project.

(D) **Cones.** Install traffic cones according to the contract or as specified by the Engineer.

Upon request of the Engineer, submit to the Engineer an FHWA approval letter certifying that the cones are NCHRP Report 350 compliant.

Maintain the traffic cones and keep the traffic cones clean and in good repair. Replace lost, stolen or damaged traffic cones as needed."

**(IV) Amend 645.04 Method of Measurement to read as follows:**

**"645.04 Method of Measurement.** The Engineer will measure Additional Police Officers And/Or Additional Traffic Control Devices such as hiring the services of additional Police Officers that the Engineer requested; furnishing, installing, maintaining and removing the additional devices; and inserting the legal notices required by the Engineer on a force account basis according to the contract and as specified by the Engineer.

The Engineer will not measure the first two Police Officers, traffic control, barricade or barricade with lamp, traffic delineator, and construction and maintenance of detours for payment."

**(V) Amend 645.05 Basis of Payment to read as follows:**

**"645.05 Basis of Payment.** The Engineer will pay for the accepted Additional Police Officers And/Or Additional Traffic Control Devices on a force account basis according to Subsection 109.04 - Extra and Force Account Work. The Engineer will compute the actual amount paid for force account work according to Subsection 109.04 - Extra and Force Account Work. The amount may be more or less than the estimated amount shown in the proposal. The force account work includes hiring the services of additional Police Officers that the Engineer requested; furnishing, installing, maintaining and removing the additional devices; inserting the legal notices; furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work. The Contractor shall submit a paid invoice for the legal notice.

The Engineer will make payment under:

| <b>Pay Item</b>   | <b>Pay Unit</b> |
|---|-----------------|
| Additional Police Officers And/Or<br>Additional Traffic Control Devices | Force Account   |

The Engineer will not pay for the first two Police Officers separately. The Engineer will consider the cost for the first two Police Officers as included in the bid price of the various contract items. The cost includes hiring the services of the Police Officers.

The Engineer will not pay for Traffic Control separately. The Engineer will consider the cost for Traffic Control as included in the contract price of the various contract items. The cost is for hiring the services of the flaggers and/or police officers; furnishing, installing, maintaining and removing all traffic controls shown in the traffic control plans; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

The Engineer will not pay for Barricade or Barricade With Lamp separately. The Engineer will consider the cost for Barricade or Barricade With Lamp as included in the contract price of the various contract items. The cost is for furnishing, delivering, installing, maintaining, relocating, and removing the barricade and furnishing and installing sand bags and other accepted weights; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

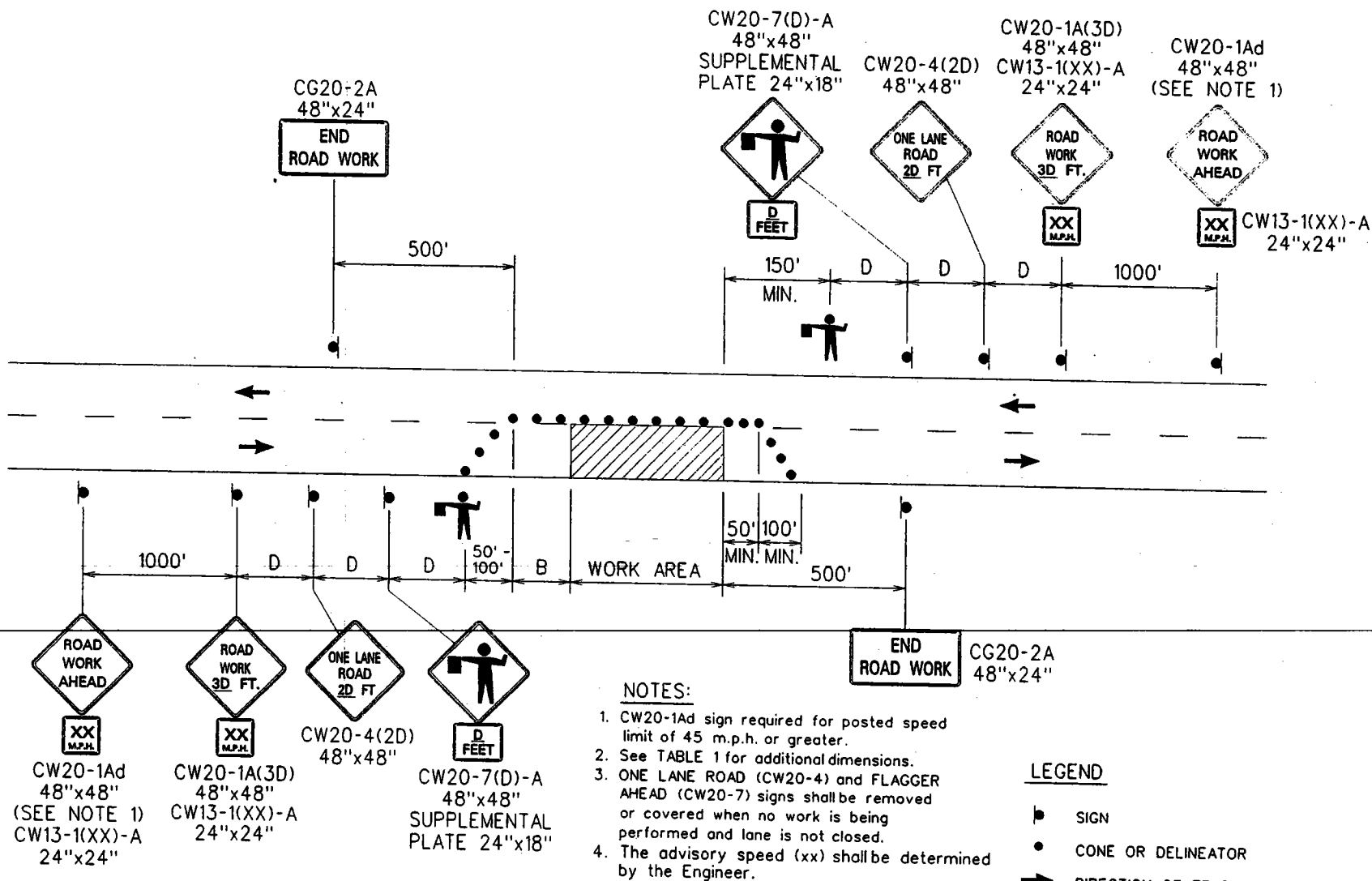
The Engineer will not pay for delineators separately. The Engineer will consider the cost for delineators as included in the contract price of the various contract items. The cost is for furnishing; installing; cleaning; maintaining correct placement; removing when required; and furnishing and installing sand bags or other accepted weights; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

The Engineer will not pay for construction and maintenance of detours separately. The Engineer will consider the cost for construction and maintenance of detours as included in the contract price of the various contract items. The cost is for replacing installed traffic delineators that are lost, stolen, or damaged and not due to the Contractor's negligence; relocating of traffic delineators to the next detour phase; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work."

(VI) Replace Figures 1 through 6 dated 5/01/93 with the attached Figure 1 dated r11/97, Figure 2 dated r2/97 and Figures 3 through 7 dated r10/96.

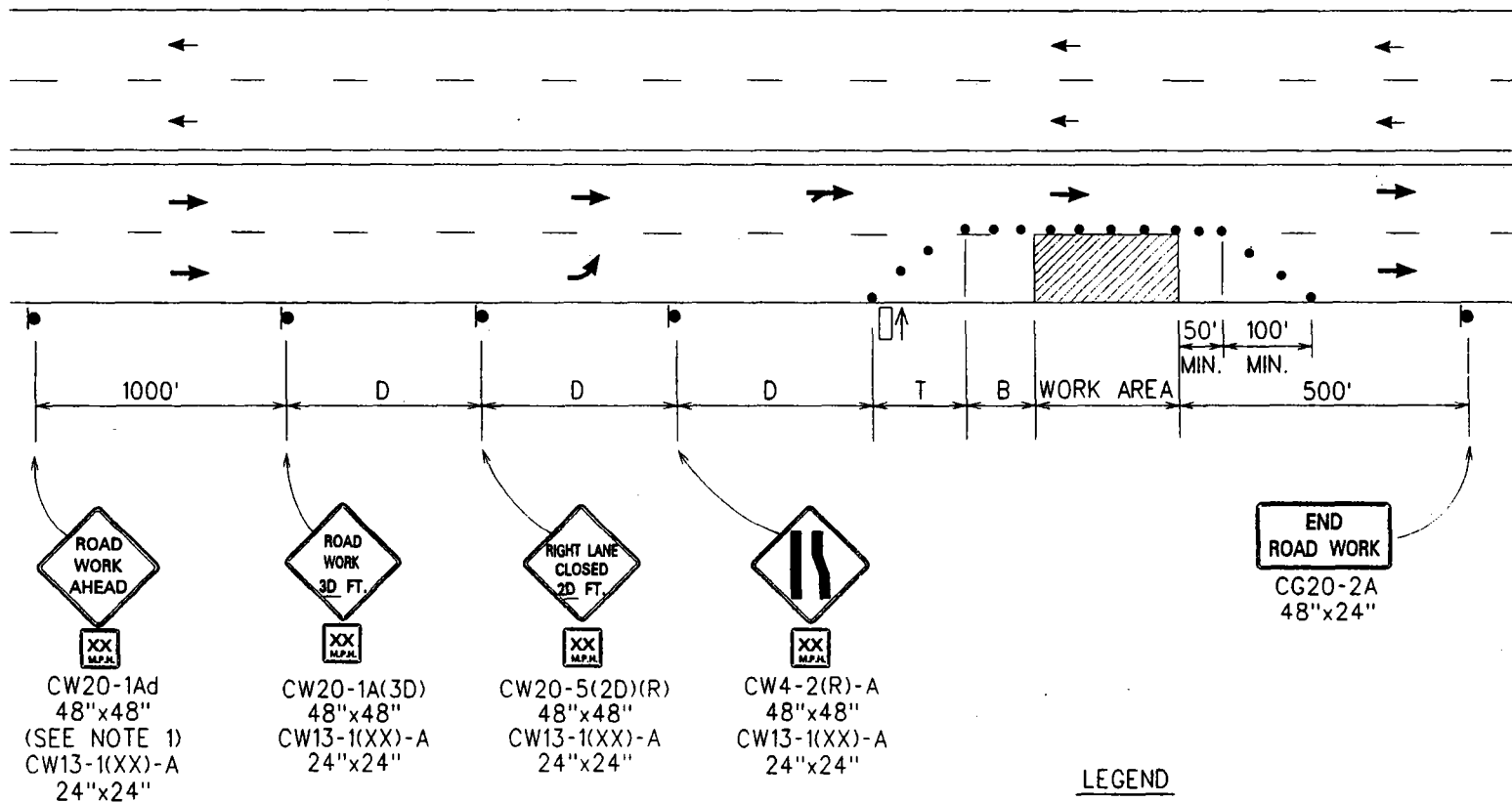
STP-050-1(27)  
645-7a

2/03/97



TWO-LANE HIGHWAY - ONE LANE CLOSED  
FIGURE 1 - TRAFFIC CONTROL PLAN

STP-050-1(27)  
645-8a



NOTES:

1. CW20-1Ad sign required for posted speed limit of 45 m.p.h. or greater
2. See TABLE 1 for additional dimensions.
3. The advisory speed (xx) shall be determined by the Engineer.

MULTILANE UNDIVIDED HIGHWAY - RIGHT LANE CLOSED

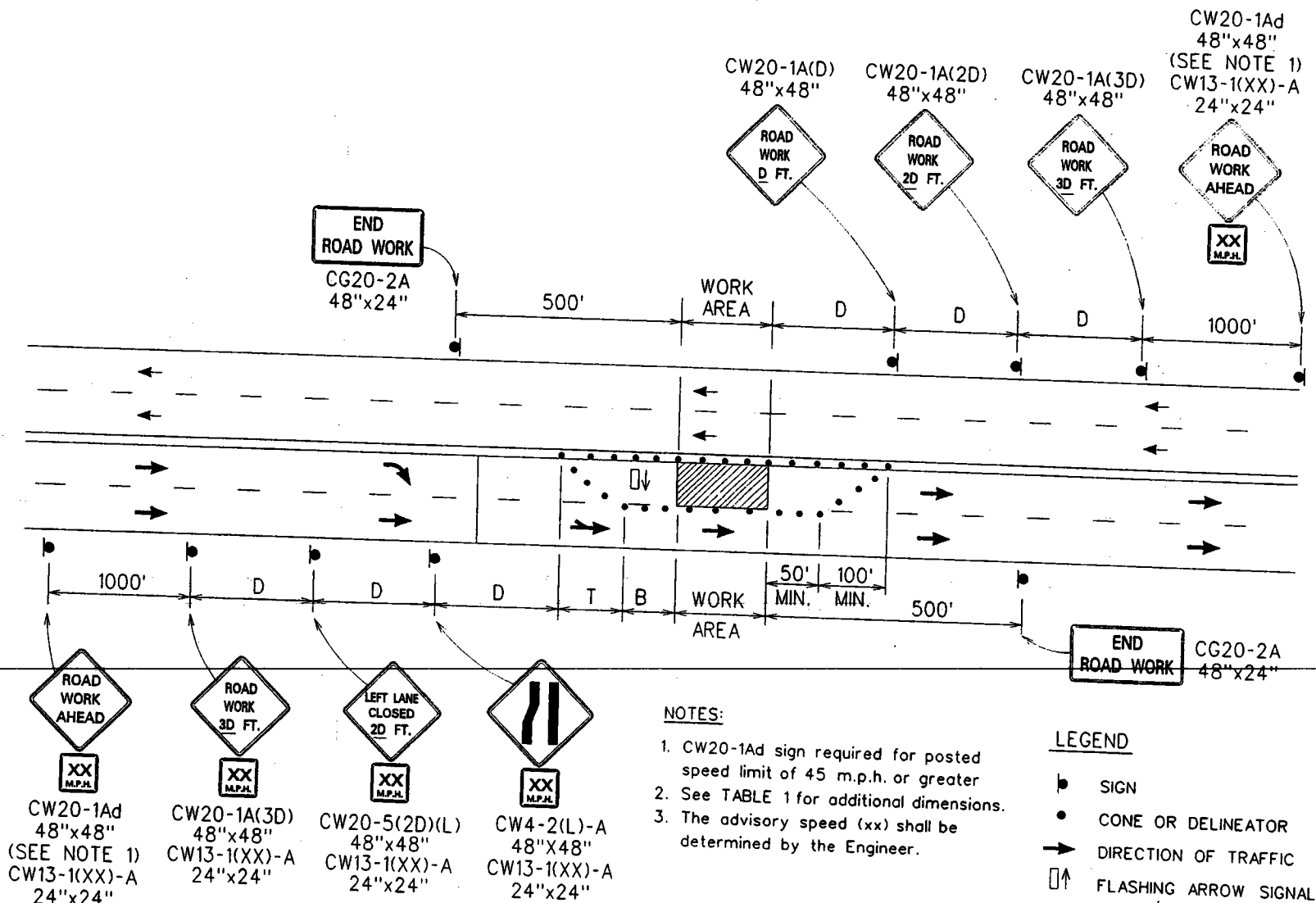
FIGURE 2 - TRAFFIC CONTROL PLAN

2/03/97



STP-050-1(27)  
645-9a

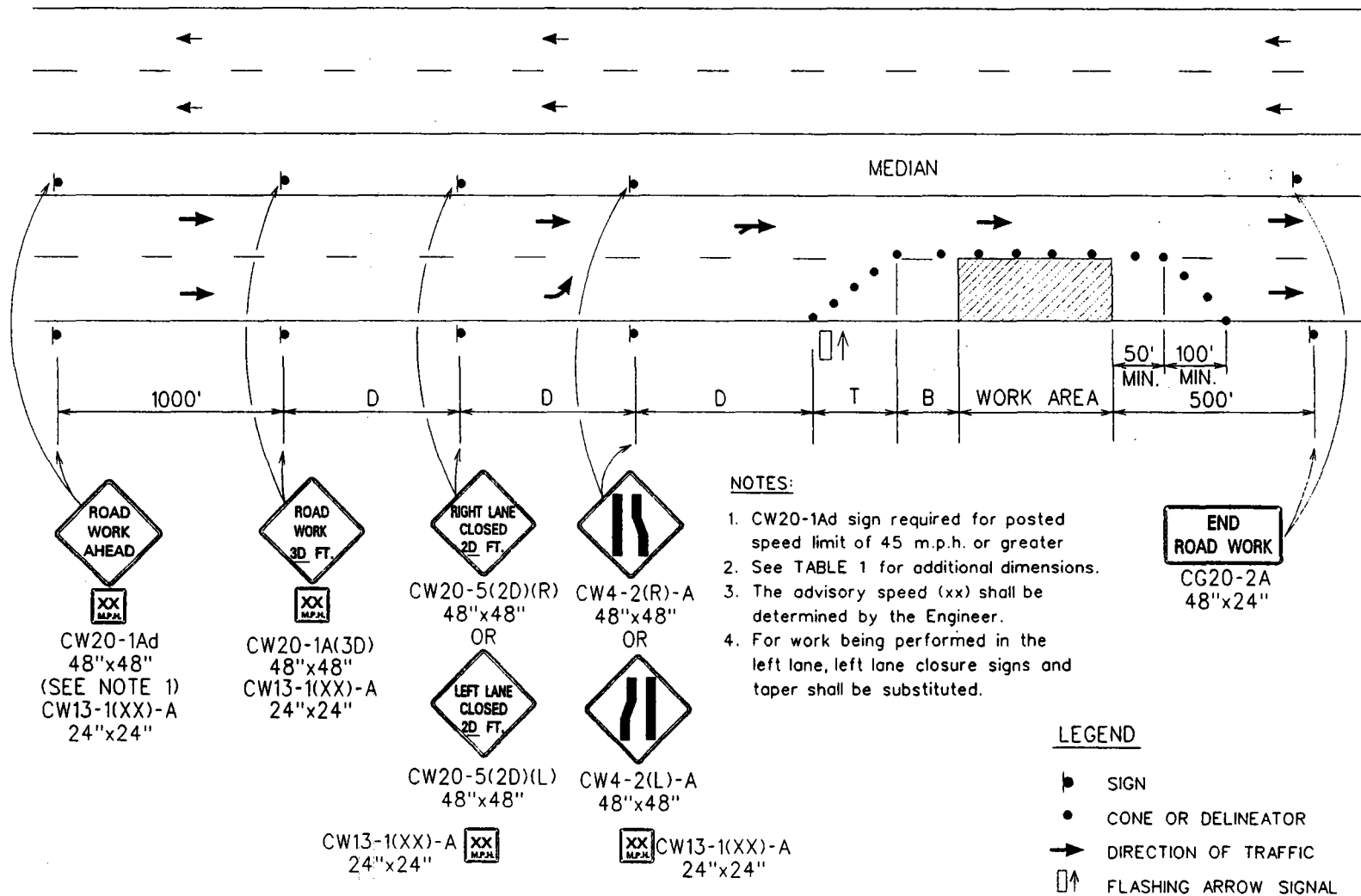
11/06/96



MULTILANE UNDIVIDED HIGHWAY - LEFT LANE CLOSED  
FIGURE 3 - TRAFFIC CONTROL PLAN

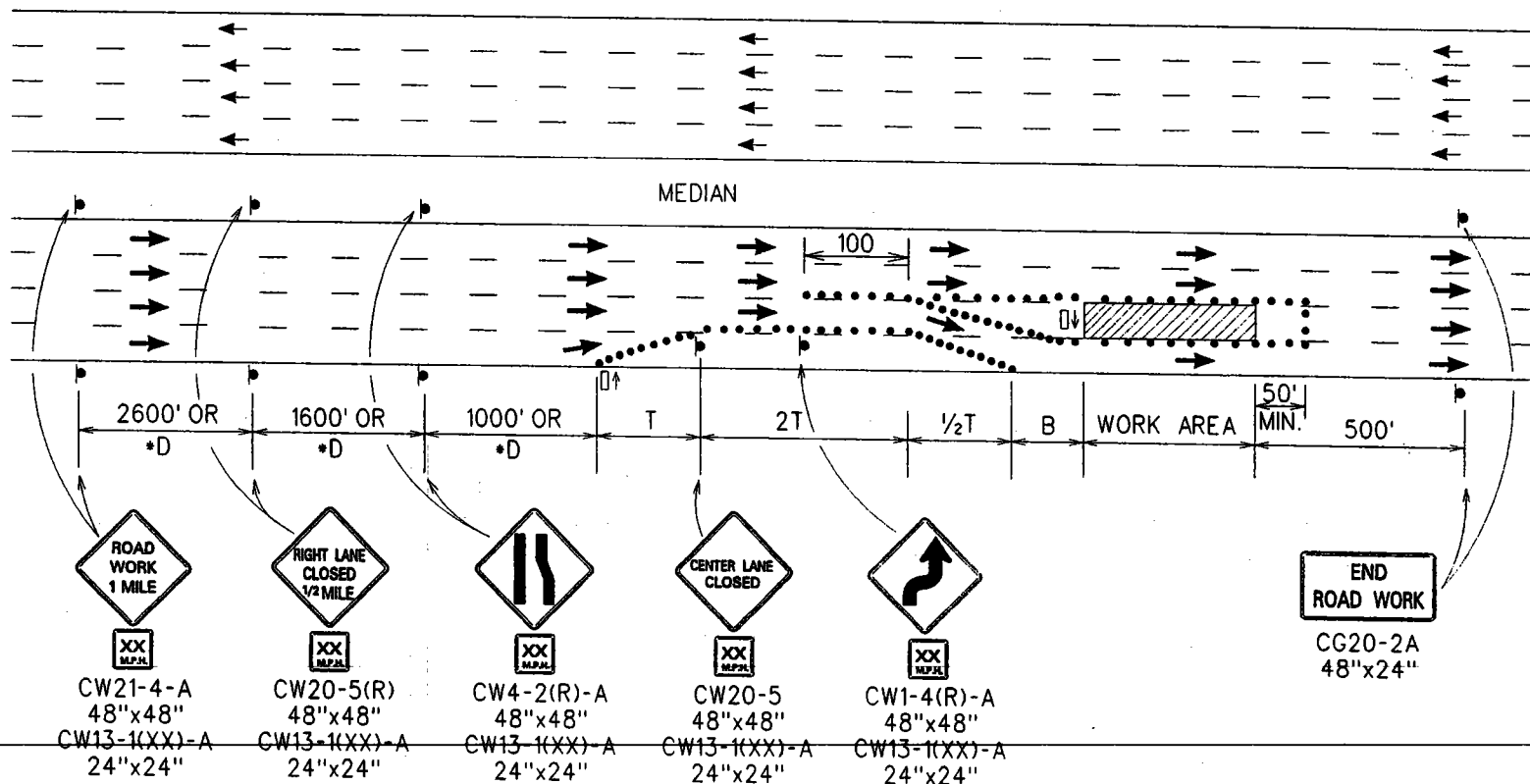
STP-050-1(27)  
645-10a

11/06/96



MULTILANE DIVIDED HIGHWAY - ONE LANE CLOSED  
FIGURE 4 - TRAFFIC CONTROL PLAN

STP-050-1(27)  
645-11a



NOTES:

1. For work being performed in the left center lane, use mirror image of above with appropriate left lane closure signs and taper.
2. For undivided highways, delete advance warning signs shown posted in median area.
3. The advisory speed (xx) shall be determined by the Engineer.
4. See TABLE 1 for additional dimensions.
5. For posted speeds of 40 m.p.h. or less, use sign spacings and taper lengths from TABLE 1 and change signs CW21-4-A and CW20-5(R) to CW20-1A(3D) and CW20-5(2D)(R) as shown in Figure 4.

LEGEND

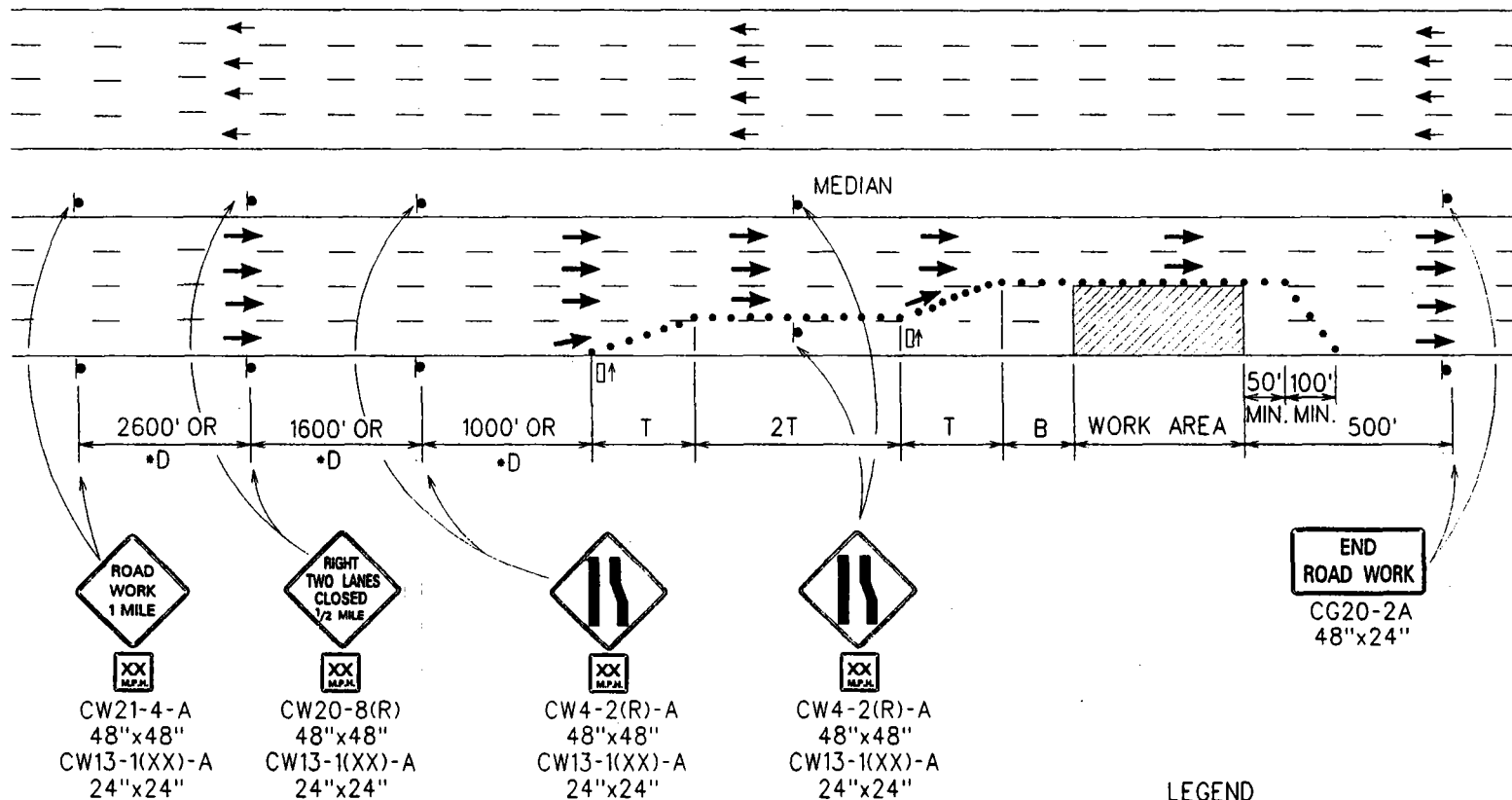
- ▬ SIGN
- CONE OR DELINEATOR
- ➔ DIRECTION OF TRAFFIC
- ⬆ FLASHING ARROW SIGNAL

MULTILANE HIGHWAY - CENTER LANE CLOSED

FIGURE 5 - TRAFFIC CONTROL PLAN

11/06/96

STP-050-1(27)  
645-12a



NOTES:

1. For work being performed in the left center lane, use mirror image of above with appropriate left lane closure signs and taper.
2. For undivided highways, delete advance warning signs shown posted in median area.
3. The advisory speed (xx) shall be determined by the Engineer.
4. See TABLE 1 for additional dimensions.
5. For posted speeds of 40 m.p.h. or less, use sign spacings and taper lengths from TABLE 1 and change signs CW21-4-A and CW20-8(R) to CW20-1A(3D) and CW20-8(2D)(R) respectively.

LEGEND

- ▬ SIGN
- CONE OR DELINEATOR
- ➔ DIRECTION OF TRAFFIC
- ⬆ FLASHING ARROW SIGNAL

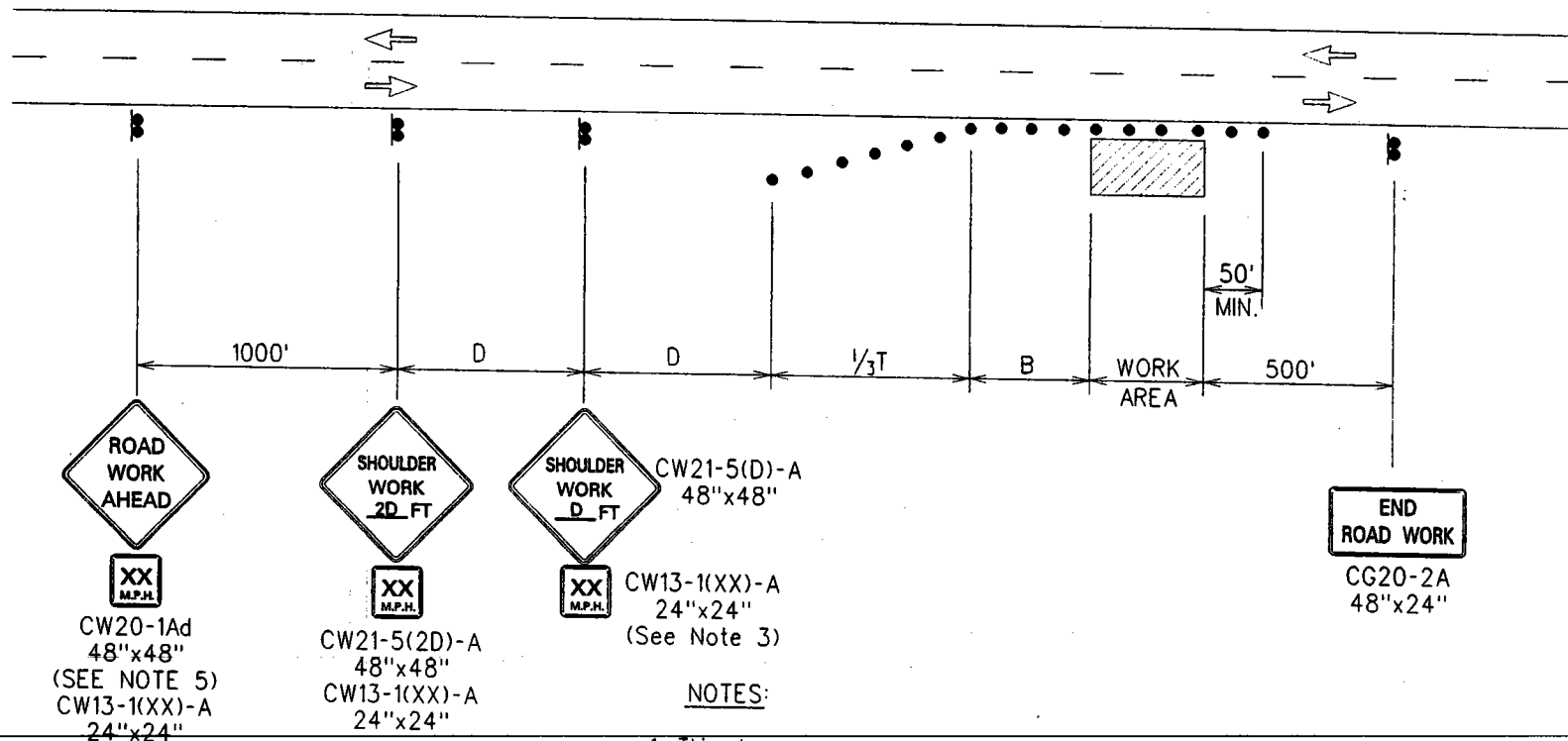
MULTILANE HIGHWAY - MULTIPLE LANE CLOSED

FIGURE 6 - TRAFFIC CONTROL PLAN

11/06/96

STP-050-1(27)  
645-13a

11/06/96



#### LEGEND

- Cone or Delineator
- ➡ Direction of traffic
- Sign

- NOTES:**
1. This plan may be used only if all road work, including equipment and workers are off the travel way.
  2. See TABLE 1 for additional dimensions.
  3. Engineer will determine if Advisory speed sign is necessary.
  4. Contractor will provide necessary adjustments to accommodate Bicyclists and Pedestrians.
  5. CW20-1Ad sign required for posted speed limit of 45 MPH or greater.
  6. Signing is not required if the work area including equipment and workers, is outside the clear zone distance, as specified in the latest AASHTO Roadside Design Guide.

## WORKING ON SHOULDER OR ROADSIDE FIGURE 7 - TRAFFIC CONTROL PLAN