Amend **Section 645 – Traffic Control Devices** to read as follows:

"SECTION 645 - WORK ZONE TRAFFIC CONTROL

645.01 Description. This section describes the following:

(A) Furnishing, installing, maintaining and subsequently removing work zone traffic control devices, and personnel. Work zone traffic control shall include providing flaggers and police officers.

(B) Keeping roads for public traffic open and in passable condition; providing and maintaining temporary access crossings for trails, businesses, parking lots, garages, residences, farms, parks, and other driveways; taking necessary work precautions for the protection, safety, and convenience of the public; should pedestrian facilities exist, taking necessary measures for safe and accessible passage, with route information and ADAAG compliance, for pedestrians traveling through or near work zone.

(C) Taking safety and precautionary measures, such as illuminating roadway obstructions during hours of darkness, in accordance with Chapter 286, HRS; Title 19, Subtitle 5, Chapters 127, 128, and 129, HAR; and *MUTCD*.

645.02 Materials.

Signs	750.01
Sign Posts	750.02
Fasteners for Signs and Route Markers	750.03
Reflector Marker	750.07
Flexible Delineator Posts and Reflectors	750.08
Traffic Delineators	750.09
Preformed Pavement Marking Tape	755.04

Submit electronic crashworthy documentation, including but not limited to, drawings in pdf and cadd, crash test reports, and FHWA eligibility letters certifying compliance with MASH 2016, for signs, sign supports, barricades, tubular markers, cones, vertical panels, and other traffic control devices. Only devices that are deemed crashworthy will be allowed.

Upon request of the Engineer, furnish self-certified MASH 2016 compliant letter from vendor for each type of Category 1 traffic control device, as defined by FHWA and/or AASHTO, including single-piece traffic cone, single-piece drum, and tubular marker.

Use of new signs, sign supports, barricades, cones, vertical panels, drums, tubular markers, and other traffic control devices that are not certified to be MASH 2016 compliant will not be allowed after December 31, 2019.

Traffic control devices, including signs, barricades, warning lights, arrow boards, portable changeable message signs, cones, tubular markers, and temporary concrete barriers shall conform to the American Traffic Safety Services Association (ATSSA), *Quality Guidelines for Temporary Traffic Control Devices and Features* and the *MUTCD*.

Other traffic control devices including barricades, warning signs, lights, and temporary signals shall conform to Title 19, Subtitle 5, Chapters 127, 128, and 129, HAR. Retroreflectorization for protective devices such as barricades, tubular markers, and warning signs shall conform to Subsection 750.01 – Signs.

645.03 Construction. Furnish, install, and maintain barricades, signs, cones, delineators, lights, flashing signals, and other traffic control devices.

Furnish one (1) police officer for each location that requires work zone traffic control, unless otherwise requested by the State. If TCP is included in the contract documents, furnish number of police officers indicated in TCP, whichever is greater.

Furnishing, deploying, maintaining, and subsequently removing two (2) portable changeable message signs (i.e., electronic message boards) for both approaches to project work zone, at locations accepted by the Engineer, seven (7) days prior to start of road work.

When directing traffic, flaggers or police officers, or both shall be in direct communication with each other.

TCP Development. Contractor shall develop site-specific Traffic Control Plan (TCP) and work schedule based on work hours and lane closure restrictions stipulated in the contract documents.

TCP shall be developed after Contractor conducted field investigation of traffic conditions, including but not limited to, traffic volume counts taken during anticipated work hours, detour routes, interchange ramp & city street traffic signal timing, and public gathering places such as schools, businesses and shopping malls within the project limits and surrounding areas.

If excessive work zone traffic delays within project limits were observed during construction, the State reserves the rights to suspend TCP if Contractor failed to adjust his work and/or TCP to address traffic concerns brought forth by the State in a timely and responsive manner.

If TCP affects City & County of Honolulu streets, such as but not limited to, traffic detours onto City streets, or traffic control devices placed on City streets, a City & County of Honolulu, Department of Transportation services (DTS) Permit for Street Usage shall be obtained prior to starting work. A TCP stamped by a registered Civil Engineer from the State of Hawaii may be required to obtain the DTS Permit for Street Usage.

TCP Submittal. Submit TCP and work schedule for review and acceptance following the procedures established in Subsection 105.04 – Review and Acceptance Process. TCP and schedule shall be accepted by the Engineer prior to starting work in each area. Submit modifications and deviations from accepted TCP following the procedures established in Subsection 105.04 – Review and Acceptance Process. Illegible TCP will not be accepted.

Include the following in TCP and schedule:

(1) Signs (type, size, designation, and placement).

(2) Traffic movements shown by arrows.

(3) Positions of flaggers and police officers.

(4) Barricades, cones, delineators, and additional traffic control devices and measures necessary for protection of work and public safety; and placement, spacing, distances, and reference points for traffic control devices.

(5) Layout, drawn to scale, of traffic control devices, including information needed to layout TCP.

(6) Brief description of work.

(7) Dates of work.

(8) Times of day affected.

(9) Proposed public information sign.

(10) Proposed news release.

(11) For lane closures indicate the max. length of roadway to be closed.

(12) For mobile operations such as rumble strip milling and striping, provide instruction details for warning sign and flagger deployment.

(13) Minimum lane width and offset distances to adjacent roadway elements (e.g., bridge railing, guardrail, portable concrete barrier, etc.)

(14) Eradicate conflicting pavement striping per Sec. 629.03(D) – Removal of Existing Pavement Markings. Eradication of existing markings by painting over them will not be allowed.

(15) If the work will affect a pedestrian or bike route, show an alternative route and provide appropriate warning signs.

Place sign or device situated farthest upstream from work zone first. Then place others progressively downstream toward work zone.

Extend cones or delineators to point where cones or delineators are visible to approaching traffic.

For signs with messages on both faces, cover inapplicable message before placement.

Keep barriers, end treatments, barricades, construction and warning signs, and other traffic control devices in good condition. Repair, clean, or replace barriers, end treatments, barricades, signs, or other devices as required to maintain effectiveness and appearance. The Engineer will solely decide if the barriers, end treatments, barricades, signs, or other traffic control devices are in suitable condition to remain or needs cleaning, repair, or other actions.

Remove or cover regulatory and warning signs that conflict with TCP. Restore signs upon completion of work or as ordered by the Engineer. Affix object markers to post(s) of covered sign.

Promptly remove or cover construction and warning signs that are not applicable or not in use.

Promptly remove traffic control devices that are no longer needed.

Remove traffic control devices in reverse order of installation, starting closest to work zone and continuing away from work zone.

Maintain abutting owners' existing access until replacement access is usable. Obtain permission from abutting owners, including conditions for closing existing access. Submit copy of agreement with abutting owners before beginning work in the affected area.

When working on existing facility that will be kept open to traffic, provide smooth and even surface for public traffic use. Only work on a portion of roadway at one time, and stage construction from one side to other while routing traffic over opposite side.

During subgrade and paving operations, paved shoulders may be used for public traffic.

Do not store work zone signs, if not in use, sign stands, material or equipment where it will interfere with public traffic. Remove equipment and other obstructions out of right-of-way or clear zone to permit free and safe passage of public traffic during non-working hours or suspension of work. For storage of materials and equipment, see Subsection 105.14 – Storage and Handling of Materials and Equipment.

Notify Fire Department, in writing, at least 24 hours before blocking or closing road access. Keep fire hydrants accessible to Fire Department by not placing material or other obstructions within five feet of fire hydrant or closer than permitted by applicable ordinances, rules, and regulations.

Notify the Engineer and County, including Bus Systems Division, Police Department, Fire Department, Emergency Medical Services, and Department of Health in writing at least five days before start of construction.

(A) Signs. Install signs sufficiently ahead of location where operations may interfere with use of road by traffic and at intermediate points where new work crosses or coincides with existing road.

Place signs in accordance with TCP as accepted by the Engineer.

(B) Construction Signs. Erect post-mounted construction signs at the beginning of project and at the end of project at the location indicated by the Engineer. These signs shall remain for the duration of the highway project. Maintain these signs. Place these signs besides the required traffic control signs called for herein.

Furnishing, installing, maintaining, and subsequently removing two (2) sets of post-mounted construction signs as ordered by the Engineer.

Install post-mounted construction signs on each main approach to the project work zone, excluding any ramps or side roads/streets.

The construction signs shall be new and become the property of the Contractor, when the project obtains final acceptance or when directed by the Engineer.

(C) Barricades

(1) General. Provide, erect, and maintain necessary barricades suitable for protection of work and safety of the public.

Barricades shall be in good condition. Barricade application and installation shall be in accordance with accepted TCP.

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

During hours of darkness, install steady burn lamps on barricades selected by the Engineer. Flashing lamps must not be used, unless directed by the Engineer or required by the Contract Documents. Attach lamps on barricade ends closest to traveled way and visible to oncoming traffic. Replace non-functioning lamps within 24 hours of discovery. Perform nighttime inspection of the lamps and work zone devices every 48 hours.

Do not install signs on barricades unless signs and barricades have been crash tested as a unit and accepted under MASH 2016.

(2) Retroreflectorization. Retroreflectorize barricade rails and attachment with retroreflective sheeting in accordance with Subsection 750.01(C)(4) - Type III or IV Retroreflective Sheeting (High Intensity) or Subsection 750.01(C)(5) - Hardened Aluminum-Backed Retroreflective Sheeting.

Retroreflectorize both vertical faces of each barricade rail.

(3) Color. Provide white colored rails, frames, and braces with front and back rail faces having 6-inch-wide alternating orange or red and white stripes sloping downward toward traveled way at angle of 45 degrees from vertical. Use stripe colors in accordance with the following:

(a) Use orange and white stripes for the following conditions:

1. Construction work.

2. Detours.

3. Maintenance work.

(b) Use red and white stripes for the following conditions:

1. On roadways with no outlet, such as dead-ends and cul-de-sacs.

2. Ramps or lanes closed for operational purposes.

3. Permanent or semi-permanent closure or termination of roadway.

(4) Maintenance. Keep barricades in good condition. Repair, repaint, clean, or replace barricades to maintain effectiveness and appearance. Immediately replace missing or damaged barricades, lamps, sandbags, and other accepted weights.

Clean and repair barricades immediately when effectiveness is impaired, or when directed by the Engineer and before relocating to other locations.

(D) Traffic Delineators. Install traffic delineators in accordance with accepted TCP.

Maintain traffic delineators in good condition. Immediately replace missing or damaged traffic delineators.

Clean delineator immediately when effectiveness is impaired or when directed by the Engineer and before relocating to a new location.

(E) Cones. Install traffic cones in accordance with accepted TCP.

Maintain traffic cones. Keep traffic cones clean and in good repair. Immediately replace lost, stolen, or damaged traffic cones.

Clean cones immediately when effectiveness is impaired or when directed by the Engineer and before relocating to a new location.

(F) Lane Closures. Lane closures will be allowed only from 8:30 a.m. to 3:00 p.m., Monday through Friday. Placement and removal of all work zone devices within the travel lanes, such as arrow boards, cones, etc., are restricted to allowable closure times.

Closure of only one lane of traffic will be allowed during lane-closure hours. Keep lanes open to traffic and allow flow at normal posted speed limit during non-lane-closure hours.

Exceptions to lane closure hours specified require written acceptance

by the Engineer. No increase in contract price or contract time will be given for lane closure restrictions specified.

See Section 107.03 – Working Hours, Night Work of the project Special Provisions for description of Noise Variance hours, noise control conditions and restrictions during weekend and night work.

For island of Oahu, no lane closures will be allowed during 24-hour periods as follows:

(1) Day preceding holiday (3:00 p.m. to Midnight), except as otherwise specified.

(2) Holidays (Midnight to Midnight).

(3) Thanksgiving weekend (Thursday to Sunday).

(4) Three-week holiday period for Christmas and New Year.

(5) One-week "Beat-the-School-Jam" period, to be determined, beginning approximately third week of August (first week of University of Hawaii Manoa Session).

(6) Other dates of events indicated in the contract documents.

No time extension will be given for the above restrictions. The contract time for the project has accounted for any loss of time due to the above restrictions.

If applicable, coordinate lane closures with adjacent project(s) at no increase in contract price or contract time.

Rental fees will be assessed in accordance with Subsection 108.09 – Rental Fees for Unauthorized Lane Closure or Occupancy, for failure to open lanes to traffic during peak hours. Morning and afternoon peak hours shall be from 5:30 a.m. to 8:30 a.m. and 3:00 p.m. to 6:00 p.m., respectively, Monday through Friday.

Before scheduling work, submit requests for detours and lane closures as follows:

(1) Detours - 8 weeks before implementing detours.

(2) Lane closures - 6 weeks before implementing lane closures.

Include the following with detour and lane closure requests:

(a) Explanation of proposed changes to existing traffic pattern.

(b) Installation schedule for informational and traffic control signs.

(c) Publication schedule for legal notices.

(d) Plan showing proposed informational signs.

(e) Plan showing lane changes or detours in accordance with accepted TCP, including details at beginning of multi-lane highway lane changes and detours.

Detours or lane closures will not be allowed before the Engineer accepts detour or lane closure request.

TABLE 645-I - FOR TRAFFIC CONTROL PLAN

POSTED SPEED LIMIT (M.P.H.)	SIGN SPACING (D) (FEET)	TAPER LENGTH (T) (FEET)		LONGI-TUDINAL BUFFER SPACE (B) (FEET)	SPACING OF CONES OR DELINEATORS (FEET)		
		W = 12' OR LESS *	W = GREATER THAN 12' *		TAPER	TANGENT	WORK 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

(G) Advisory Signs. Submit advisory sign shop drawings. Furnish, install, maintain and remove two (2) advisory as ordered by the Engineer.

Place signs at locations designated by the Engineer. Provide signs, minimum 8 feet wide by 4 feet high, with black letters on orange background, and with three 4.00 pounds/foot flanged channel posts for each sign.

Include starting date and hours of construction in sign message. Use letter heights of 8 inches, Series D. The Engineer will review and accept advisory signs' wording before fabrication. Install advisory signs two weeks before start of construction. Remove advisory signs immediately after

construction has been completed or as ordered by the Engineer.

(H) Advertisement. Place advertisement in newspaper, as ordered by Engineer, for the following traffic pattern changes or night work:

(1) Detours.

(2) Lane closure.

(3) Permanent road closure.

(4) Permanent new route that changes previous route.

Include the following information:

(a) Map of traffic pattern change limits.

(b) Map showing lane(s) closure and detour pattern.

(c) Notice of starting and ending dates and duration.

(d) Explanation of lane(s) closure or detours in "Notice To Motorist".

Quality of map shall conform to the following requirements:

(1) No freehand printing or penciling.

(2) Highlight important features by darkening, cross-hatching, crossing-out, or coloring important words, as necessary.

(3) Provide maps with minimum size of five columns wide and four columns deep. Lesser width columns may be considered to balance against size of drawing.

(4) Text specifications.

(a) Work being featured - 3/16-inch text.

(b) Major roads and features - 1/8-inch text.

(c) Other roads and features- first letter of sentence upper case.

(d) "NOTICE TO MOTORIST" in upper case.

(e) Message - first letter of sentence upper case.

(5) Line Thickness.

(a) Important feature being advertised - line thicker than rest of map.

(b) Directional arrow - bolder than rest of lines shown on map, when important, to show route traffic should use.

(6) Show reference direction such as "TO HONOLULU" with arrow.

Submit the following:

(1) "Notice to Motorists" before placement in newspaper, six weeks before start of work.

(2) Actual size of notice to be published in newspaper. The Engineer will not allow size reduction of notices once accepted. Submit final, camera-ready “Notice to Motorists” advertisement.

Place advertisement for three consecutive days and within one week before traffic pattern changes, in publication as ordered by the Engineer.

645.04 Measurement.

(A) Traffic control as specified in Subsection 645.03 - Construction will be measured on a contract lump sum basis and will not include any work performed under other specific traffic control contract bid items. Measurement for payment will not apply.

(B) The Engineer will measure additional police officers, additional traffic control devices, and advertisement, if ordered by the Engineer, on a force account basis, in accordance with Subsection 109.06 - Force Account Provisions and Compensation.

(C) The two (2) portable changeable message signs (i.e., electronic message boards) for both approaches to project work zone, as accepted by the Engineer, shall not be paid for separately and shall be considered incidental to the contract item No. 645.1000, Traffic Control.

645.05 Payment. The Engineer will pay for the accepted traffic control, additional police officers, additional traffic control devices, specific traffic control contract bid items and advertisement at the contract price per pay unit, as shown in the proposal schedule. Payment will be full compensation for the work prescribed in this section and the contract documents.

The Engineer will pay for the following pay items when included in the proposal schedule:

Pay Item	**Pay Unit**
Traffic Control	Lump Sum
Additional Police Officers, Additional Traffic Control Devices, and Advertisement	Force Account

An estimated amount for the force account may be allocated in the proposal schedule under “Additional Police Officers and Additional Traffic Control Devices”, but the actual amount to be paid will be the sum shown on the accepted force account records, whether this sum be more or less than the estimated amount allocated in the proposal schedule.

The Engineer will not pay for request submittals. The Engineer will not consider claims for additional compensation of late submittals or requests by Contractor.

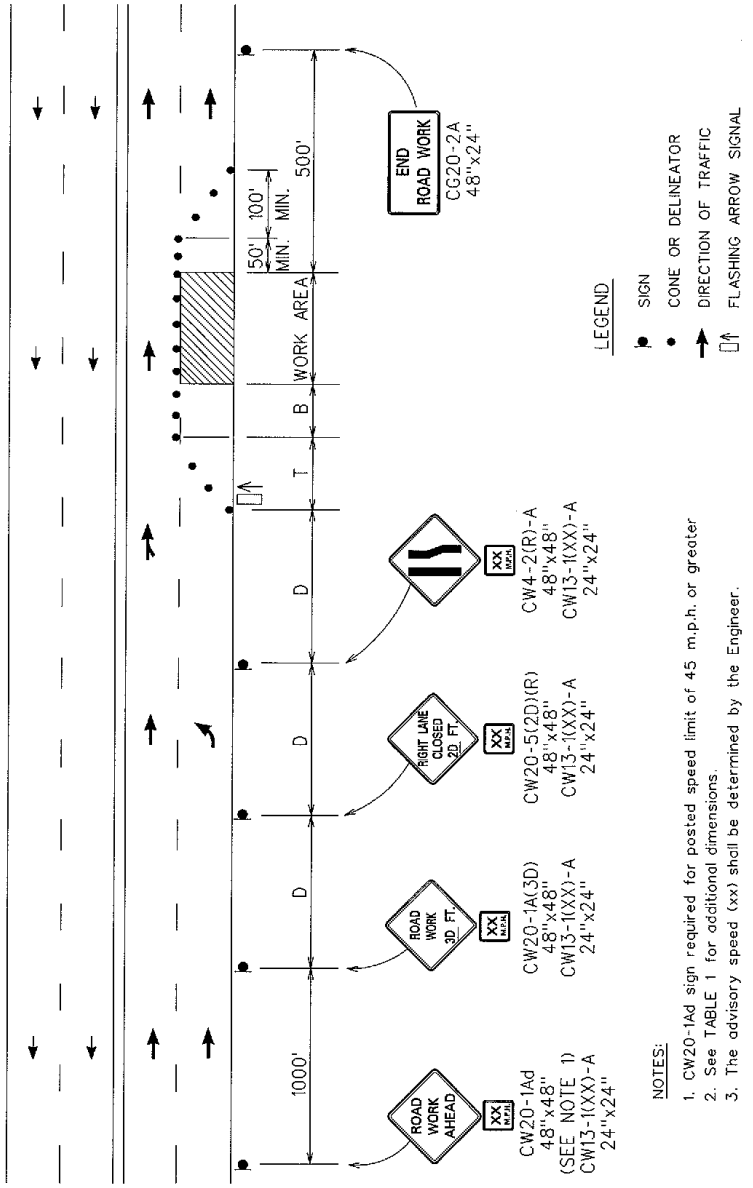
TWO-LANE HIGHWAY - ONE LANE CLOSED

FIGURE 1 - TRAFFIC CONTROL PLAN

R11/97

517
518
519

520



NOTES:

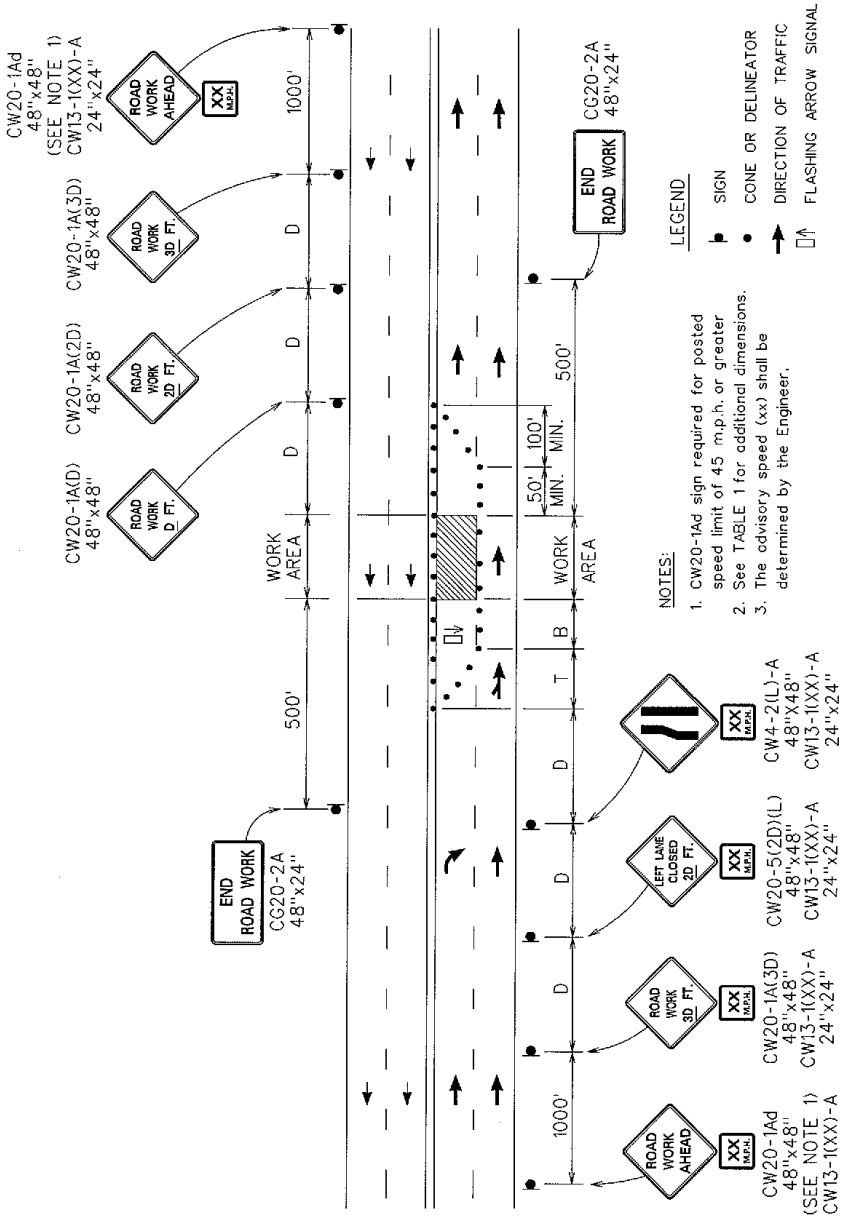
1. CW20-1Ad sign required for posted speed limit of 45 m.p.h. or greater
2. See TABLE 1 for additional dimensions.
3. The advisory speed (xx) shall be determined by the Engineer.

MULTILANE UNDIVIDED HIGHWAY - RIGHT LANE CLOSED

FIGURE 2 - TRAFFIC CONTROL PLAN

R2/97

521
522

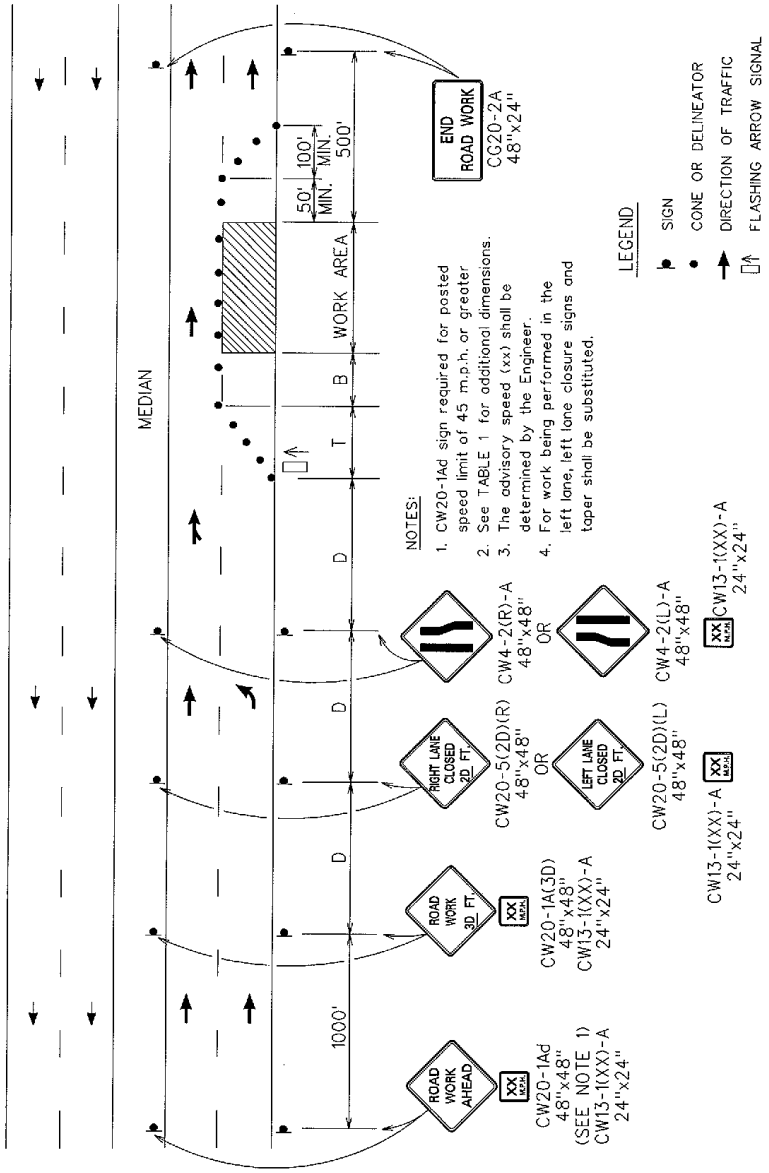


R10/96

MULTILANE UNDIVIDED HIGHWAY - LEFT LANE CLOSED

FIGURE 3 - TRAFFIC CONTROL PLAN

526
527
528
529



R10/96

MULTILANE DIVIDED HIGHWAY - ONE LANE CLOSED

FIGURE 4 - TRAFFIC CONTROL PLAN

530

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.

MULTILANE HIGHWAY - CENTER LANE CLOSED

FIGURE 5 - TRAFFIC CONTROL PLAN

R10/96

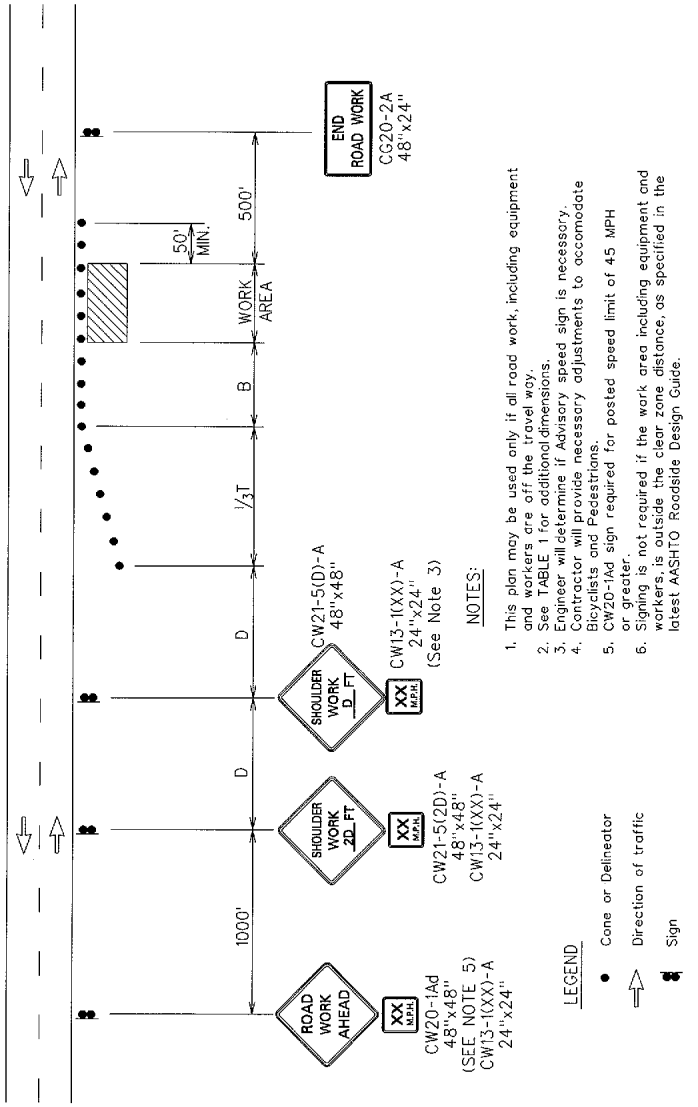
NOTES:

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.

MULTILANE HIGHWAY - MULTIPLE LANE CLOSED

FIGURE 6 - TRAFFIC CONTROL PLAN

R10/96



WORKING ON SHOULDER OR ROADSIDE

FIGURE 7 - TRAFFIC CONTROL PLAN

R10/96

"

END OF SECTION 645