

1 **SECTION 645 - WORK ZONE TRAFFIC CONTROL**
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4 **645.01 Description.** This section describes the following:
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6 **(A)** Furnishing, installing, maintaining and subsequently removing work
 7 zone traffic control devices, and personnel. Work zone traffic control shall
 8 include providing flaggers and police officers.
 9

10 **(B)** Keeping roads for public traffic open and in passable condition;
 11 providing and maintaining temporary access crossings for trails, businesses,
 12 parking lots, garages, residences, farms, parks, and other driveways; taking
 13 necessary work precautions for the protection, safety, and convenience of
 14 the public; should pedestrian facilities exist, taking necessary measures for
 15 safe and accessible passage, with route information and ADAAG
 16 compliance, for pedestrians traveling through or near work zone.
 17

18 **(C)** Taking safety and precautionary measures, such as illuminating
 19 roadway obstructions during hours of darkness, in accordance with Chapter
 20 286, HRS; Title 19, Subtitle 5, Chapters 127, 128, and 129, HAR; and
 21 *MUTCD*.
 22

23 **645.02 Materials.**
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25 Signs	750.01
26	
27 Sign Posts	750.02
28	
29 Fasteners for Signs and Route Markers	750.03
30	
31 Reflector Marker	750.07
32	
33 Flexible Delineator Posts and Reflectors	750.08
34	
35 Traffic Delineators	750.09
36	
37 Preformed Pavement Marking Tape	755.04
38	

39 Submit 10 sets of FHWA approval letters certifying compliance with NCHRP
 40 Report 350 for signs, sign supports, barricades, delineators, cones, vertical panels,
 41 and other traffic control devices. Use of signs, sign supports, barricades,
 42 delineators, cones, vertical panels, and other traffic control devices that are not
 43 certified to be NCHRP Report 350 compliant will not be allowed.
 44

45 Upon request of the Engineer, furnish self-certified NCHRP Report 350
 46 compliant letter from vendor for each type of Category 1 traffic control device, as
 47 defined in NCHRP Report 350, including single-piece traffic cone, single-piece
 48 drum, tubular marker, and delineator.

645.02

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Traffic control devices, including signs, barricades, warning lights, arrow boards, changeable message signs, cones, delineators, and markers, shall conform to the American Traffic Safety Services Association (ATSSA), *Quality Standards for Work Zone Traffic Control Devices* and *MUTCD*.

Protective devices including barricades, warning signs, lights, and temporary signals shall conform to Title 19, Subtitle 5, Chapters 127, 128, and 129, HAR. Reflectorization for protective devices such as barricades, delineators, 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 two police officers for each location that requires work zone traffic control. If TCP is included in the contract documents, furnish number of police officers indicated in TCP.

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

Submit TCP and schedule at least 15 working days before work starts. Submit modifications and deviations from accepted TCP and schedule at least 15 working days before start of work requiring modification or deviation . 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.

98 **(9)** Proposed public information sign.

99

100 **(10)** Proposed news release.

101

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

104

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

107

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

110

111 Keep barricades, construction and warning signs, and other traffic control
112 devices in good condition. Repair, clean, or replace barricades, signs, or other
113 devices as required to maintain effectiveness and appearance. The Engineer alone
114 will decide suitable condition of each barricade, sign, or other traffic control device.

115

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

119

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

122

123 Promptly remove traffic control devices that are no longer needed.

124

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

127

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

132

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

137

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

140

141 Do not store material or equipment where it will interfere with public traffic.
142 Remove equipment and other obstructions out of right-of-way or clear zone to
143 permit free and safe passage of public traffic during non-working hours or
144 suspension of work. For storage of materials and equipment, see Subsection
145 105.14 – Storage and Handling of Materials and Equipment.

645.03

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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.

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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.

156

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(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.

160

161

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

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(B) Construction Signs. Erect 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.

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The construction signs shall be new and become the property of the Contractor.

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172

(C) Barricades

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

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177

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

179

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183

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.

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During hours of darkness, install steady burn or flashing lamps on barricades selected by the Engineer. Attach lamps on barricade ends closest to traveled way and visible to oncoming traffic.

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Do not install signs on barricades unless signs and barricades have been crash tested as a unit and accepted under NCHRP Report 350.

192

193

(2) Retroreflectorization. Retroreflectorize barricade rails and attachment with retroreflective sheeting in accordance with

194 Subsection 750.01(C)(4) - Type III or IV Retroreflective Sheeting
 195 (High Intensity) or Subsection 750.01(C)(5) - Hardened Aluminum-
 196 Backed Retroreflective Sheeting.

197
 198 Retroreflectorize both vertical faces of each barricade rail.

199
 200 **(3) Color.** Provide white colored rails, frames, and braces with
 201 front and back rail faces having 6-inch-wide alternating orange or red
 202 and white stripes sloping downward toward traveled way at angle of
 203 45 degrees from vertical. Use stripe colors in accordance with the
 204 following:

205
 206 **(a)** Use orange and white stripes for the following
 207 conditions:

- 208
 209 **1.** Construction work.
 210
 211 **2.** Detours.
 212
 213 **3.** Maintenance work.

214
 215 **(b)** Use red and white stripes for the following conditions:

- 216
 217 **1.** On roadways with no outlet, such as dead-ends
 218 and cul-de-sacs.
 219
 220 **2.** Ramps or lanes closed for operational purposes.
 221
 222 **3.** Permanent or semi-permanent closure or
 223 termination of roadway.

224
 225 **(4) Maintenance.** Keep barricades in good condition. Repair,
 226 repaint, clean, or replace barricades to maintain effectiveness and
 227 appearance. Immediately replace missing or damaged barricades,
 228 lamps, sandbags, and other accepted weights.

229
 230 Clean and repair barricades before relocating to other
 231 locations.

232
 233 **(D) Traffic Delineators.** Install traffic delineators in accordance with
 234 accepted TCP.

235
 236 Maintain traffic delineators in good condition. Immediately replace
 237 missing or damaged traffic delineators.

238
 239 Clean delineator prior to relocating to new location.

240
 241 **(E) Cones.** Install traffic cones in accordance with accepted TCP.

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

Clean cones prior to relocating to new location.

(F) Lane Closures. Lane closures will be allowed only from 8:30 a.m. to 3:00 p.m., Monday through Friday. 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.

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)** Day before and day after Thanksgiving Day (Midnight to Midnight).
- (4)** Three-week holiday period for Christmas and New Years (Midnight to Midnight).
- (5)** Three-week "Beat-the-School-Jam" period, to be determined, (Midnight to Midnight) beginning approximately third week of August.
- (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.

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 nonlane-closure hours.

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.

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

- 292
293 (1) Detours - 8 weeks before implementing detours.
294
295 (2) Lane closures - 6 weeks before implementing lane closures.

296 Include the following with detour and lane closure requests:

- 297
298 (1) Explanation of proposed changes to existing traffic pattern.
299
300 (2) Installation schedule for informational and traffic control signs.
301
302 (3) Publication schedule for legal notices.
303
304 (4) Plan showing proposed informational signs.
305
306 (5) Plan showing lane changes or detours in accordance with
307 accepted TCP, including details at beginning of multi-lane highway
308 lane changes and detours.
309

310 Detours or lane closures will not be allowed before the Engineer
311 accepts detour or lane closure request.
312
313

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	TANGEN T	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

314
315 (G) **Advisory Signs.** Submit advisory sign shop drawings. Construct,
316 install, maintain, and remove two advisory signs as ordered by the Engineer.
317 Place signs at locations designated by the Engineer. Provide signs,
318 minimum 8 feet wide by 4 feet high, with black letters on orange background,
319 and with three 4.00 pounds/foot flanged channel posts for each sign.
320

321 Include starting date and hours of construction in sign message. Use
 322 letter heights of 8 inches, Series D. The Engineer will review and accept
 323 advisory signs' wording before fabrication. Install advisory signs two weeks
 324 before start of construction. Remove advisory signs immediately after
 325 construction has been completed or as ordered by the Engineer.

326

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

329

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(1) Detours.

331

332

(2) Lane closure.

333

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(3) Permanent road closure.

335

336

(4) Permanent new route that changes previous route.

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338

Include the following information:

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340

(1) Map of traffic pattern change limits.

341

342

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

343

344

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

345

346

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

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Quality of map shall conform to the following requirements:

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351

(1) No freehand printing or penciling.

352

353

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

354

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(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.

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(4) Text specifications.

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

363

364

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

365

366

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

367

368

- 369 (d) "NOTICE TO MOTORIST" in upper case.
 370
 371 (e) Message - first letter of sentence upper case.
 372
 373 (5) Line Thickness.
 374
 375 (a) Important feature being advertised - line thicker than
 376 rest of map.
 377
 378 (b) Directional arrow - bolder than rest of lines shown on
 379 map, when important, to show route traffic should use.
 380
 381 (6) Show reference direction such as "TO HONOLULU" with
 382 arrow.

383
 384 Submit the following:

- 385
 386 (1) "Notice to Motorists" before placement in newspaper, six
 387 weeks before start of work.
 388
 389 (2) Actual size of notice to be published in newspaper. The
 390 Engineer will not allow size reduction of notices once accepted.
 391 Submit final, camera-ready "Notice to Motorists" advertisement.
 392

393 Place advertisement for three consecutive days and within one week
 394 before traffic pattern changes, in publication as ordered by the Engineer.
 395

396 **645.04 Measurement.**

397
 398 (A) Traffic control as specified in Subsection 645.03 - Construction will be
 399 measured on a contract lump sum basis. Measurement for payment will not
 400 apply.
 401

402 (B) The Engineer will measure additional police officers, additional traffic
 403 control devices, and advertisement, if ordered by the Engineer, on a force
 404 account basis, in accordance with Subsection 109.06 - Force Account
 405 Provisions and Compensation.
 406

407 **645.05 Payment.** The Engineer will pay for the accepted traffic control,
 408 additional police officers, additional traffic control devices, and advertisement at the
 409 contract price per pay unit, as shown in the proposal schedule. Payment will be full
 410 compensation for the work prescribed in this section and the contract documents.
 411

412 The Engineer will pay for the following pay items when included in the
 413 proposal schedule:
 414

415 **Pay Item**

Pay Unit

416

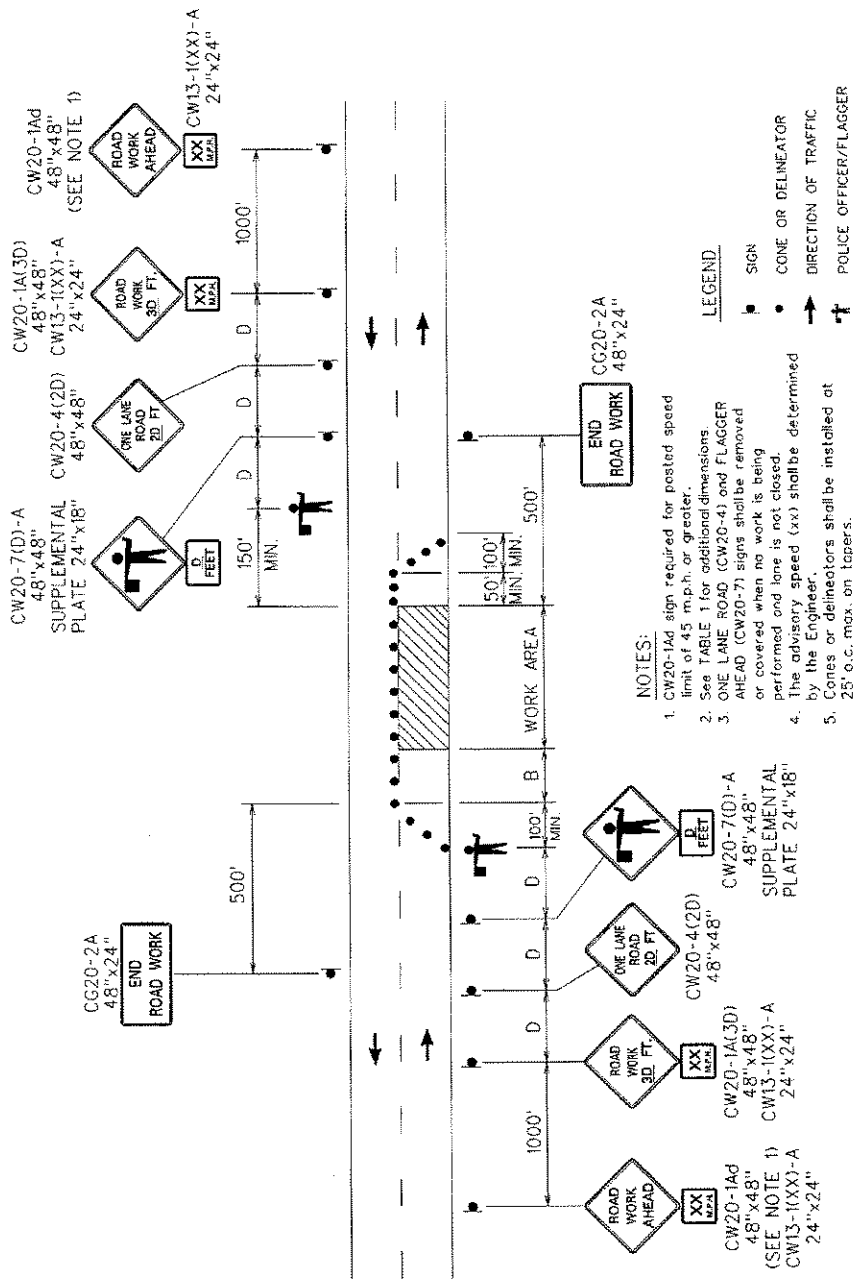
645.05

417 Traffic Control Lump Sum
418
419 Additional Police Officers, Additional Traffic Control Devices,
420 And Advertisement Force Account
421

422 An estimated amount for the force account may be allocated in the proposal
423 schedule under "Additional Police Officers And Additional Traffic Control Devices",
424 but the actual amount to be paid will be the sum shown on the accepted force
425 account records, whether this sum be more or less than the estimated amount
426 allocated in the proposal schedule.

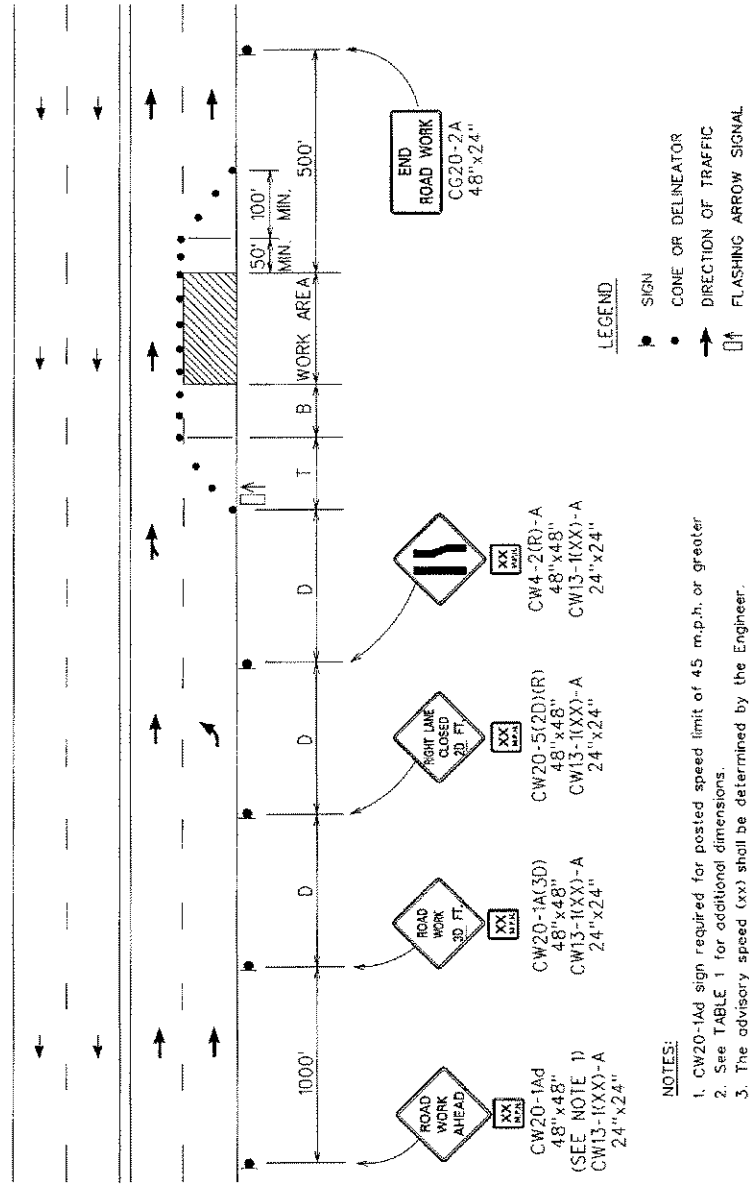
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428 The Engineer will not pay for request submittals. The Engineer will not
429 consider claims for additional compensation of late submittals or requests by
430 Contractor.

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

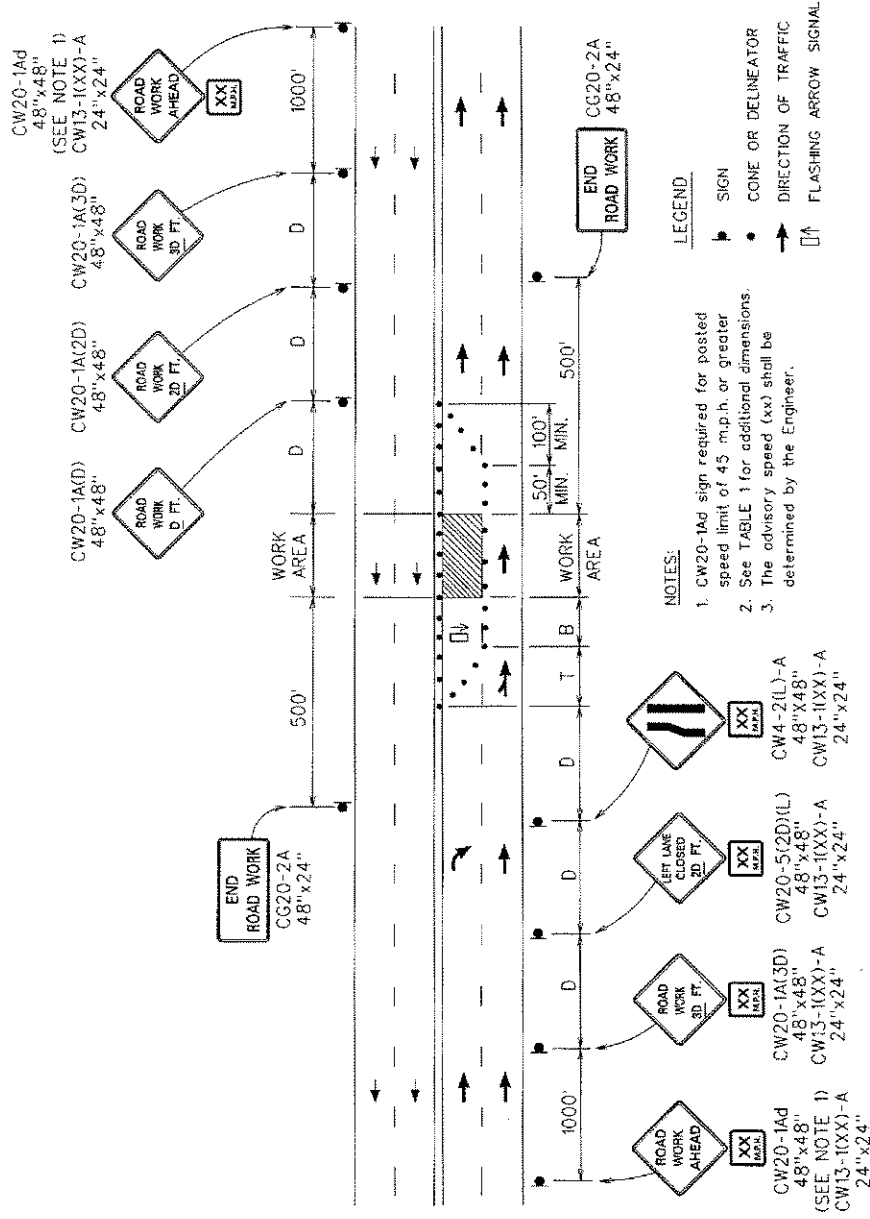
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MULTILANE UNDIVIDED HIGHWAY - RIGHT LANE CLOSED

FIGURE 2 - TRAFFIC CONTROL PLAN

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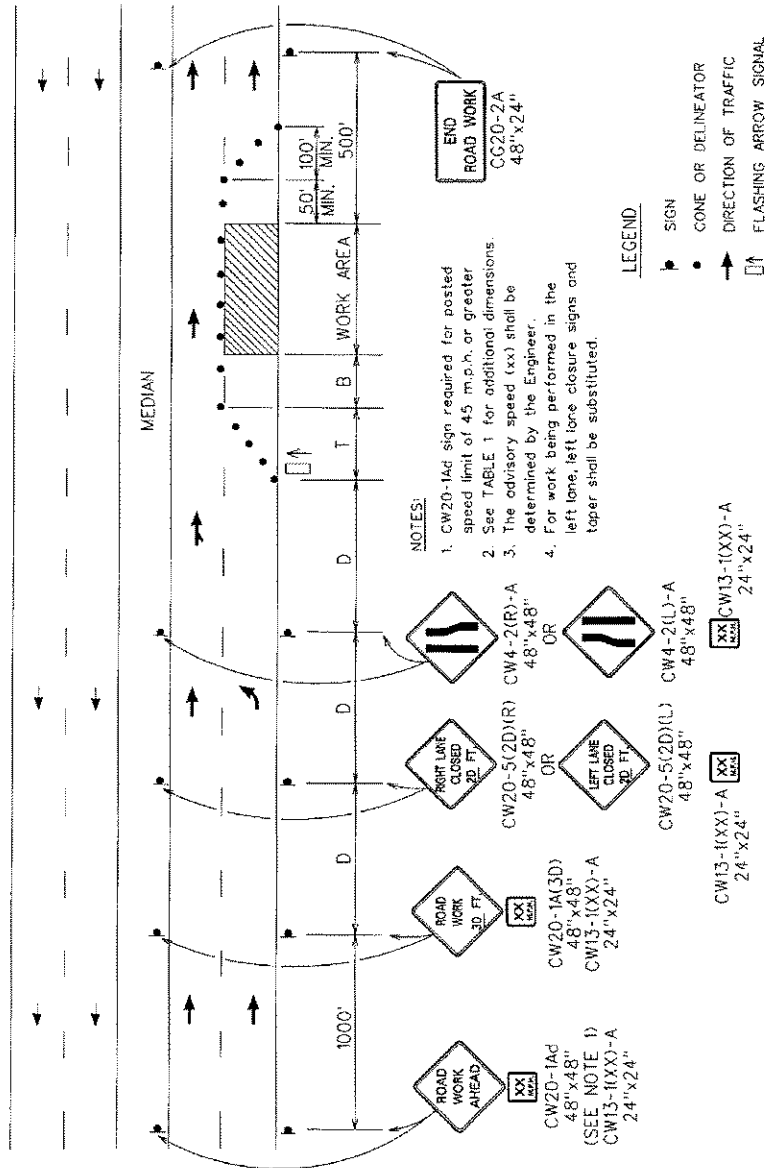


MULTILANE UNDIVIDED HIGHWAY - LEFT LANE CLOSED

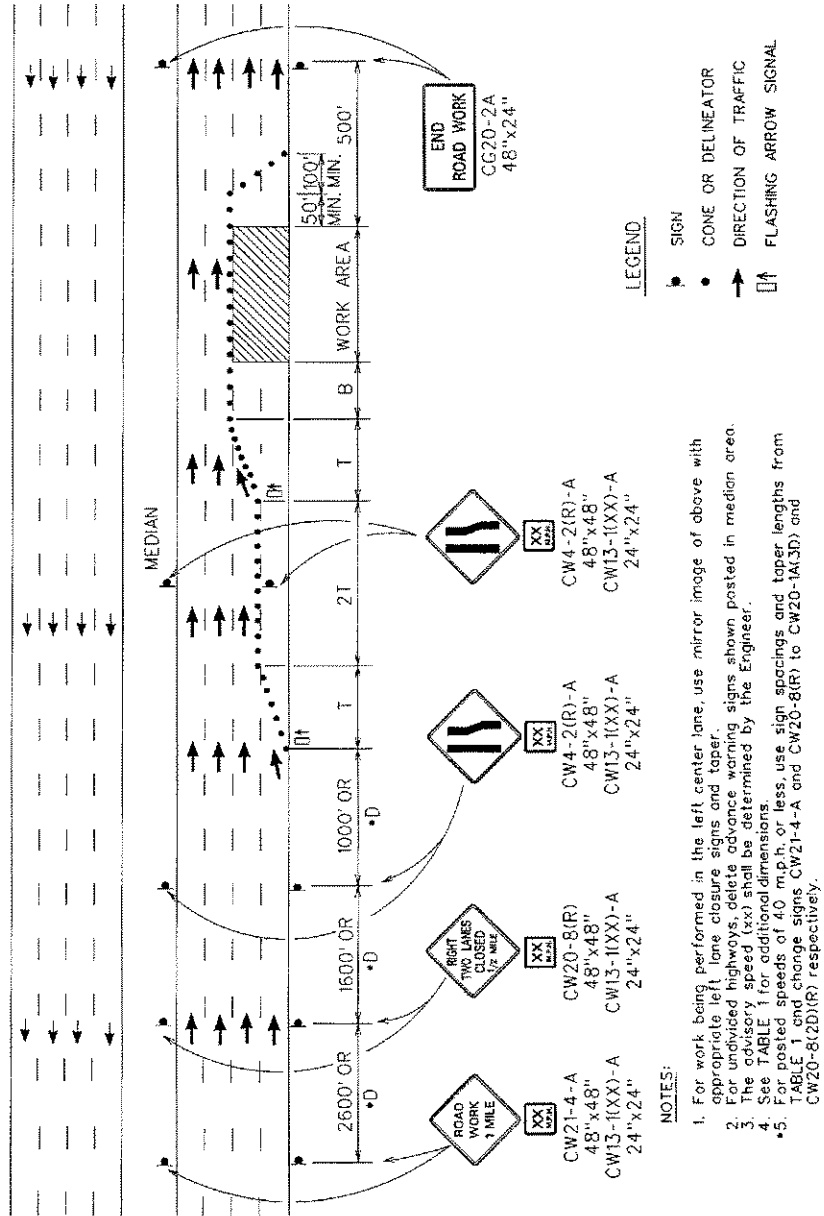
FIGURE 3 - TRAFFIC CONTROL PLAN

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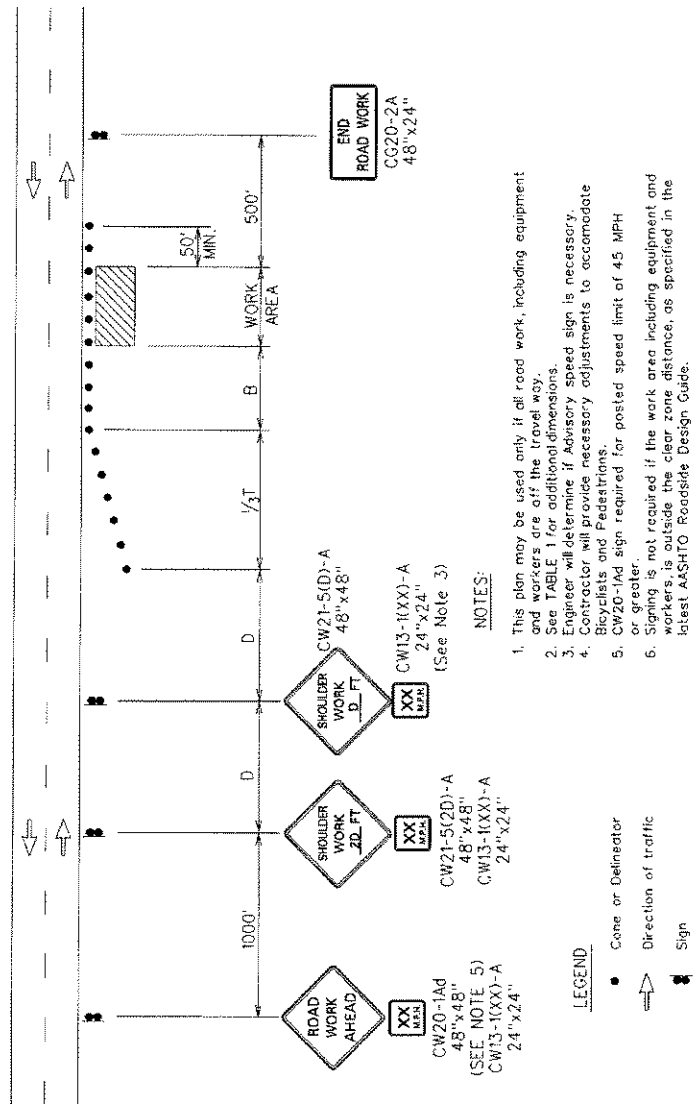


MULTILANE DIVIDED HIGHWAY - ONE LANE CLOSED
FIGURE 4 - TRAFFIC CONTROL PLAN



MULTILANE HIGHWAY - MULTIPLE LANE CLOSED

FIGURE 6 - TRAFFIC CONTROL PLAN



WORKING ON SHOULDER OR ROADSIDE
FIGURE 7 - TRAFFIC CONTROL PLAN

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END OF SECTION 645