

PCMS 1	
1	2
SLOW TRAFFIC AHEAD	NEXT # MILES
2.0 SEC	2.0 SEC

FIELD LOCATE AT LEAST 1/2 +/- MILE IN ADVANCE OF PCMS 2.

RELOCATE AS NEEDED TO REMAIN 1 +/- MILE IN ADVANCE OF QUEUE.

PCMS MAY BE TRUCK MOUNTED; IF SO, THE THREE TRANSVERSE DRUMS ARE OPTIONAL.

REMOVE WHEN QUEUE NO LONGER PRESENT.

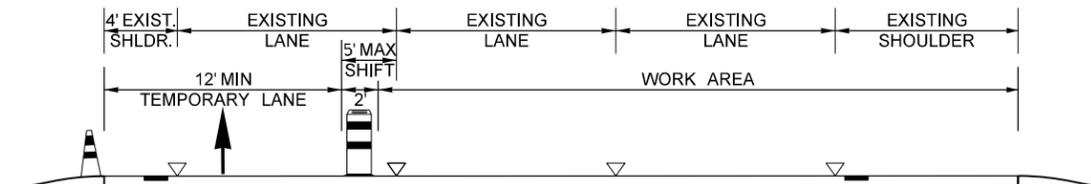
= APPROXIMATE QUEUE LENGTH ROUNDED UP TO NEAREST MILE

LOCATE PCMS PER WSDOT STANDARD SPECIFICATION 1-10.3(3)C.

PCMS 2	
1	2
ROAD NARROWS	SHOULDER DRIVING AHEAD
2.0 SEC	2.0 SEC

FIELD LOCATE 1/4 +/- MILE IN ADVANCE OF W20-1 SIGN.

LOCATE PCMS PER WSDOT STANDARD SPECIFICATION 1-10.3(3)C.

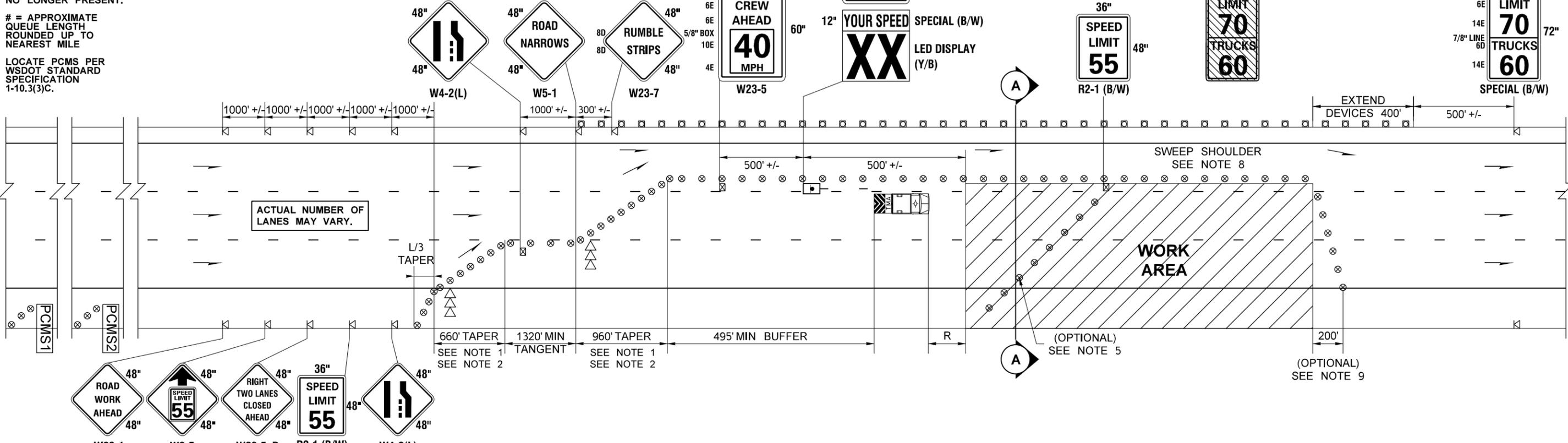


MAXIMUM DEVICE SPACING (feet)	CHANNELIZATION (feet)	
	TAPER	TANGENT
55	40	80

STATIONARY TRANSPORTABLE ATTENUATOR ROLL AHEAD DISTANCE = R			
HOST VEHICLE WEIGHT 9,900 TO 22,000 lbs.		HOST VEHICLE WEIGHT > 22,000 lbs.	
55 MPH	123'	55 MPH	100'

MINIMUM SHOULDER CLOSURE TAPER LENGTH = L/3	
SHOULDER WIDTH (feet)	55 MPH
6	120'
10	200'

USE A MINIMUM 3 DEVICES FOR SHOULDER LESS THAN 6'.



LEGEND

- ⊠ TEMPORARY SIGN LOCATION
- ⊞ TEMPORARY SIGN LOCATION (5' MIN HEIGHT)
- ⊞ 28" REFLECTIVE TRAFFIC CONE
- ⊞ 42" TALL CHANNELIZATION DEVICE
- ⊞ TRAFFIC SAFETY DRUM
- ⊞ RADAR SPEED DISPLAY SIGN
- ⊞ SEQUENTIAL ARROW SIGN
- ⊞ TRANSPORTABLE ATTENUATOR
- ⊞ PCMS PORTABLE CHANGEABLE MESSAGE SIGN

- NOTES:**
- DISTANCE BETWEEN LANE CLOSURE/SHIFT TAPERS AND ALL OPEN RAMP SHALL BE 500' MINIMUM.
 - IF FEASIBLE, AVOID PLACING LANE CLOSURE/SHIFT TAPERS WITHIN LIMITS OF HORIZONTAL CURVES.
 - RELOCATE TO REMAIN 1000' +/- PRIOR TO WORK AREA. AS ORDERED BY THE ENGINEER, ADDITIONAL SIGN MAY BE USED 1000' +/- PRIOR TO EACH WORK CREW WITHIN WORK AREA.
 - RELOCATE TO REMAIN 500' +/- PRIOR TO WORK AREA. AS ORDERED BY THE ENGINEER, ADDITIONAL SPEED RADAR DISPLAY SIGN MAY BE USED 500' +/- PRIOR TO EACH WORK CREW WITHIN WORK AREA.
 - PLACE TRANSVERSELY ACROSS CLOSURE AT A 45° ANGLE WITH 5' SPACING AT STRATEGIC LOCATIONS OR EVERY 1000' +/-.
 - PLACE ADDITIONAL R2-1 SIGNS POSITIONED AS NOT TO CONFLICT WITH THE ADVISORY SPEED SIGNAGE.
 - ALL SPEED LIMIT SIGNS CONFLICTING WITH WORK ZONE SPEED LIMIT SHALL BE COVERED PER STANDARD SPECIFICATIONS 8-21.3(3).
 - PRIOR TO SHIFTING TRAFFIC, LEFT SHOULDER AND LEFT RAMP GORES SHALL BE SWEEPED THROUGHOUT LIMITS OF TRAFFIC SHIFT.
 - REOPENING TAPER OPTIONAL TO ALLOW FOR CONSTRUCTION VEHICLES TO ACCELERATE STRAIGHT OUT OF WORK AREA INTO THE RIGHT LANE.
 - OPTIONAL IF PERMANENT SPEED LIMIT SIGNS ARE WITHIN 1500' +/- OF THE REOPENING TAPER.

- FOR ROADWAY WIDTH RESTRICTIONS OF LESS THAN 16 FEET, CONTACT WSDOT COMMERCIAL VEHICLE SERVICES IN ADVANCE FOR OVERSIZE FREIGHT WIDTH RESTRICTIONS.
- WHEN TRAFFIC SHIFTED ONTO PAVED SHOULDERS OR ACROSS GORES, VERIFY CROSS-SLOPE IS TRAVERSABLE.
- IF ROADWAY NARROWS (AT BRIDGES, ETC.) WHEN TRAFFIC SHIFTED ONTO PAVED SHOULDER, MAINTAIN 12' MINIMUM LANE WIDTH BY SHIFTING OPEN LANE AT 55:1 TAPER AS NECESSARY WITH APPROPRIATE W1-4R AND W1-4L SIGNAGE PLACED 500' +/- PRIOR.
- SIGNS ARE BLACK ON ORANGE UNLESS OTHERWISE INDICATED.
- THIS TRAFFIC CONTROL PLAN IS APPLICABLE TO SHORT-TERM AND INTERMEDIATE-TERM DURATION LANE CLOSURES OF 3 DAYS OR LESS.

**FREWAY (3 LANES): DOUBLE RIGHT LANE CLOSURE WITH 5' MAX SHIFT ONTO LEFT SHOULDER
(70 MPH TO 55 MPH VARIABLE WORK ZONE SPEED LIMIT REDUCTION, 40 MPH ADVISORY SPEED)
NOT TO SCALE**

FILE NAME	C:\Users\LintzF\Desktop\Work Zone TCPs\237Fwy2RtLanes5MaxLtShift70to55WZSL40Adv.dgn	REGION NO.	STATE	FED.AID PROJ.NO.	Washington State Department of Transportation	Plot 1
TIME	1:57:58 PM	10	WASH			PLAN REF NO TC237
DATE	4/30/2019	JOB NUMBER				SHEET 1
PLOTTED BY	LintzF	CONTRACT NO.				OF 3
DESIGNED BY	HAAPALA & LINTZ	LOCATION NO.				SHEETS
ENTERED BY	F. LINTZ					
CHECKED BY	S. HAAPALA					
PROJ. ENGR.						
REGIONAL ADM.						

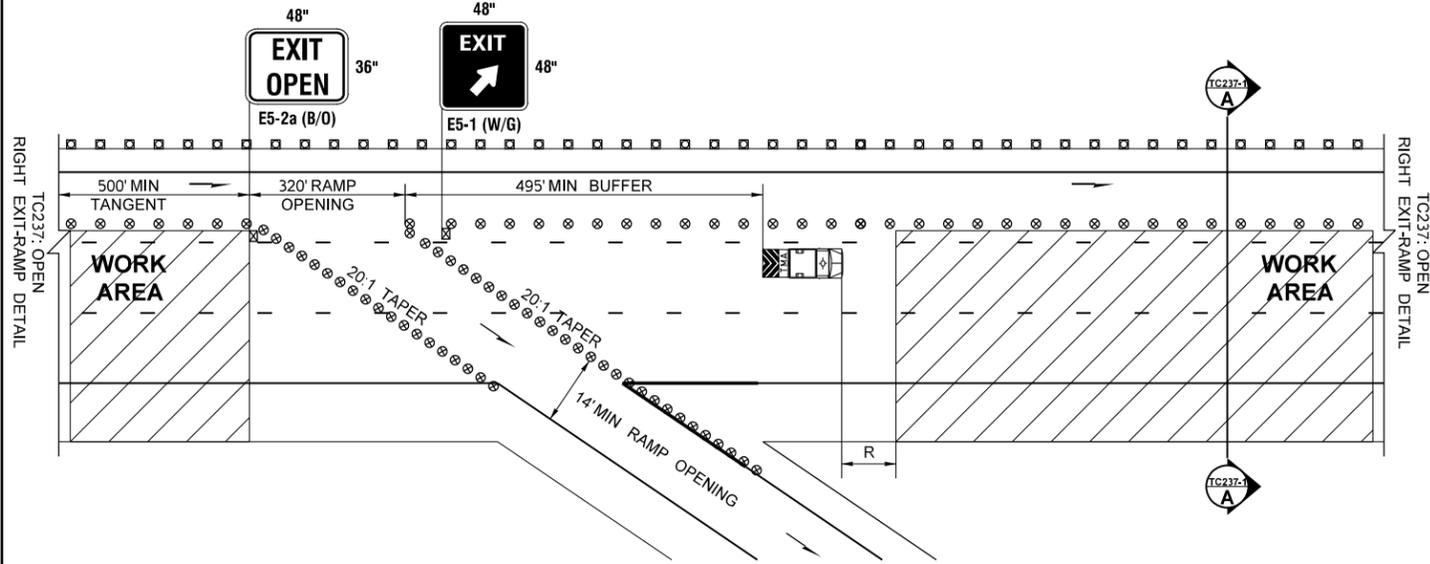
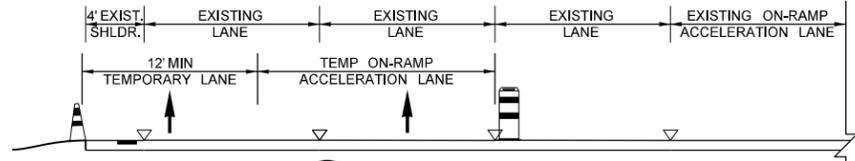
TYPICAL TRAFFIC CONTROL PLANS

NOTES:

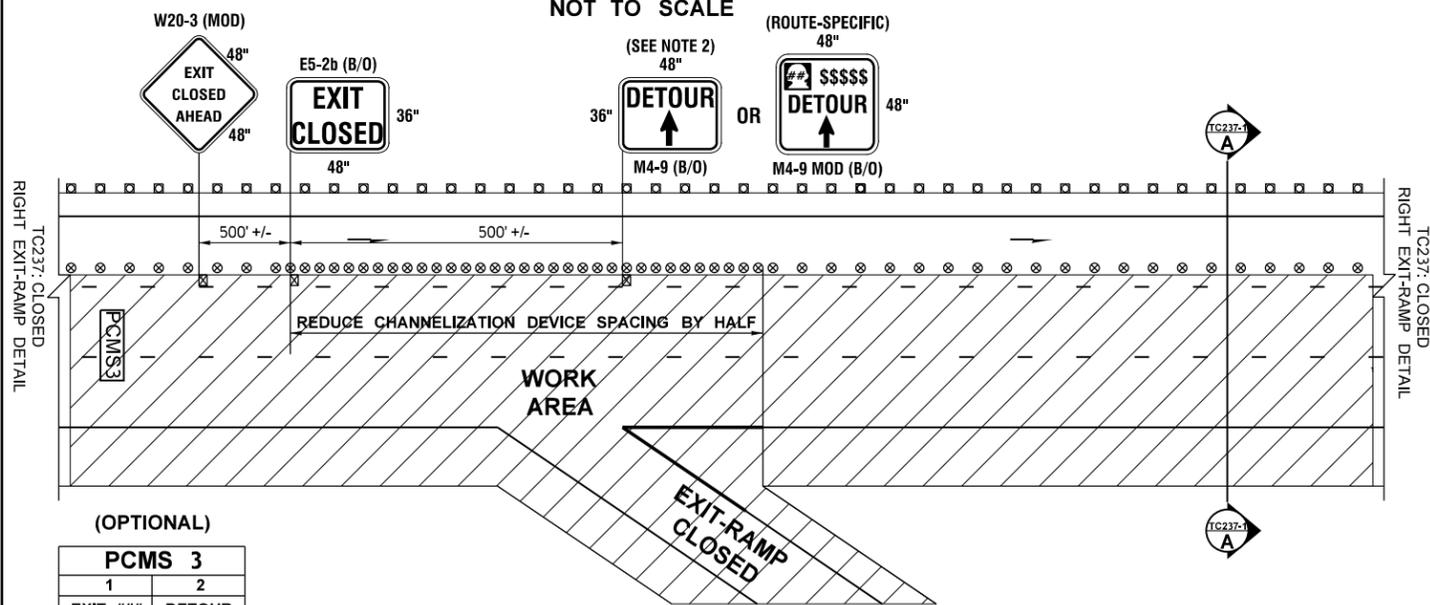
- FOR LEGEND, TABLES, AND ADDITIONAL NOTES: SEE TC237, SHEET 1.
- SEE DETOUR PLAN FOR ADDITIONAL RAMP CLOSURE DETOUR SIGNAGE.

PCMS 4	
1	2
ONE LANE SHIFTED LEFT	SHOULDER DRIVING AHEAD
2.0 SEC	2.0 SEC

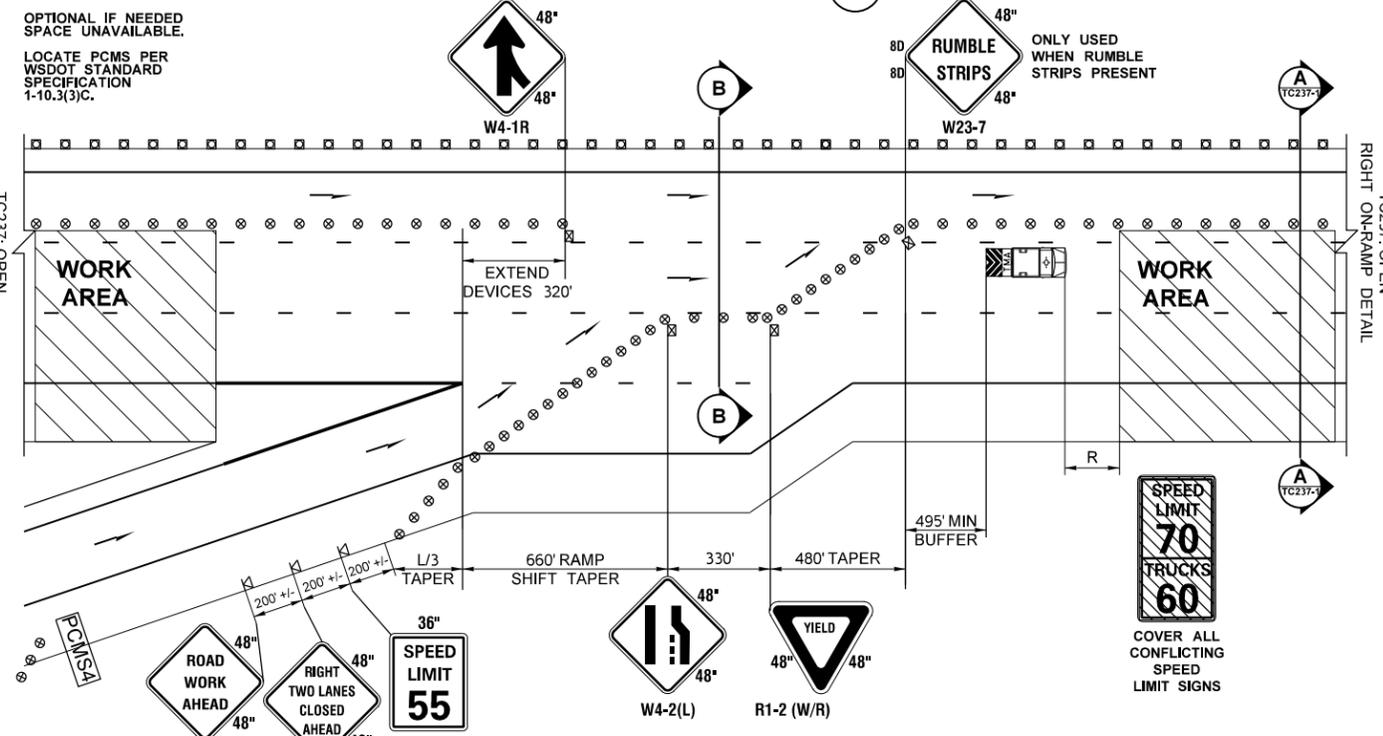
FIELD LOCATE ALONG ON-RAMP WHERE SPACE ALLOWS.
 OPTIONAL IF NEEDED SPACE UNAVAILABLE.
 LOCATE PCMS PER WSDOT STANDARD SPECIFICATION 1-10.3(3)C.



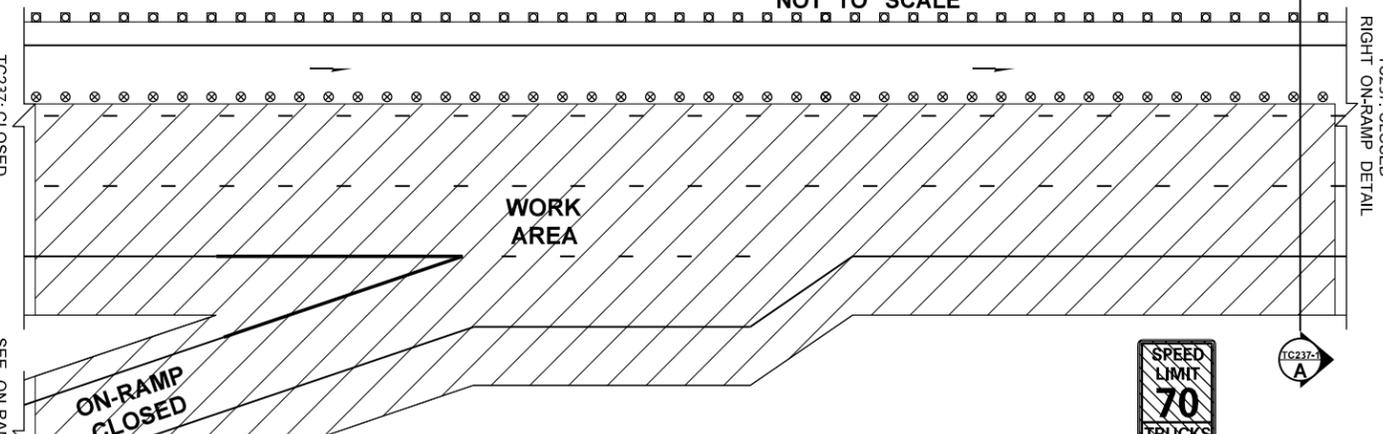
OPEN RIGHT EXIT-RAMP DETAIL



CLOSED RIGHT EXIT-RAMP DETAIL



OPEN RIGHT ON-RAMP DETAIL



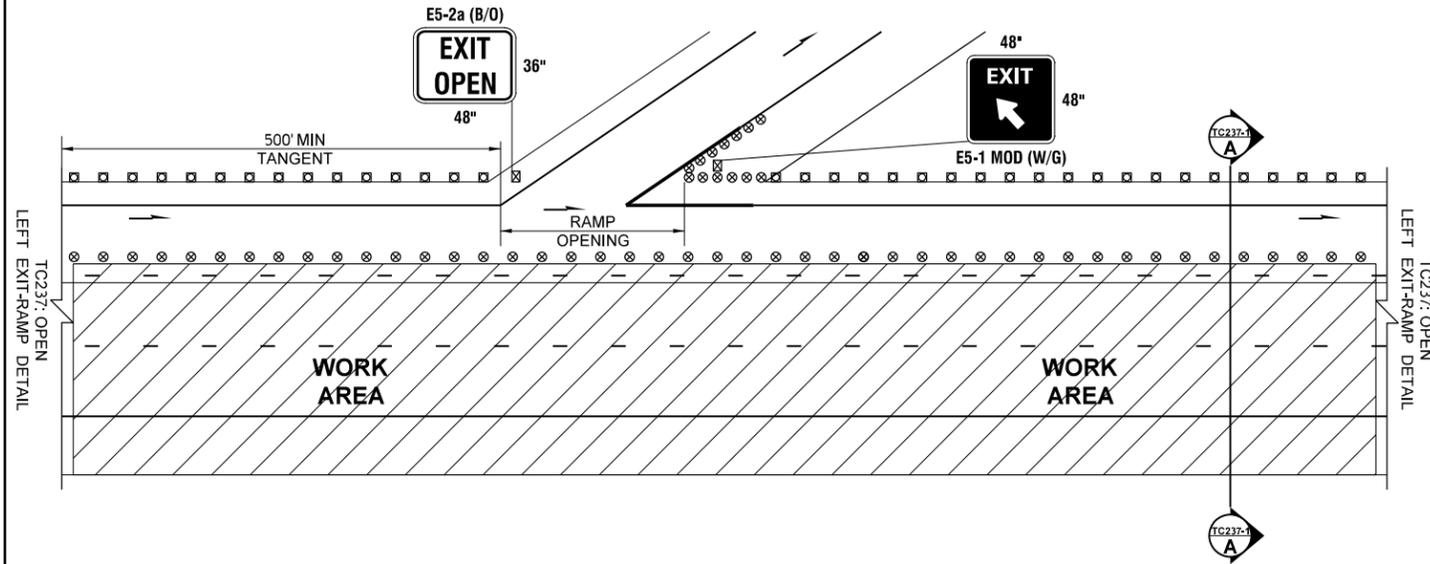
CLOSED RIGHT ON-RAMP DETAIL

FREEWAY (3 LANES): DOUBLE RIGHT LANE CLOSURE WITH 5' MAX SHIFT ONTO LEFT SHOULDER (70 MPH TO 55 MPH VARIABLE WORK ZONE SPEED LIMIT REDUCTION, 40 MPH ADVISORY SPEED)

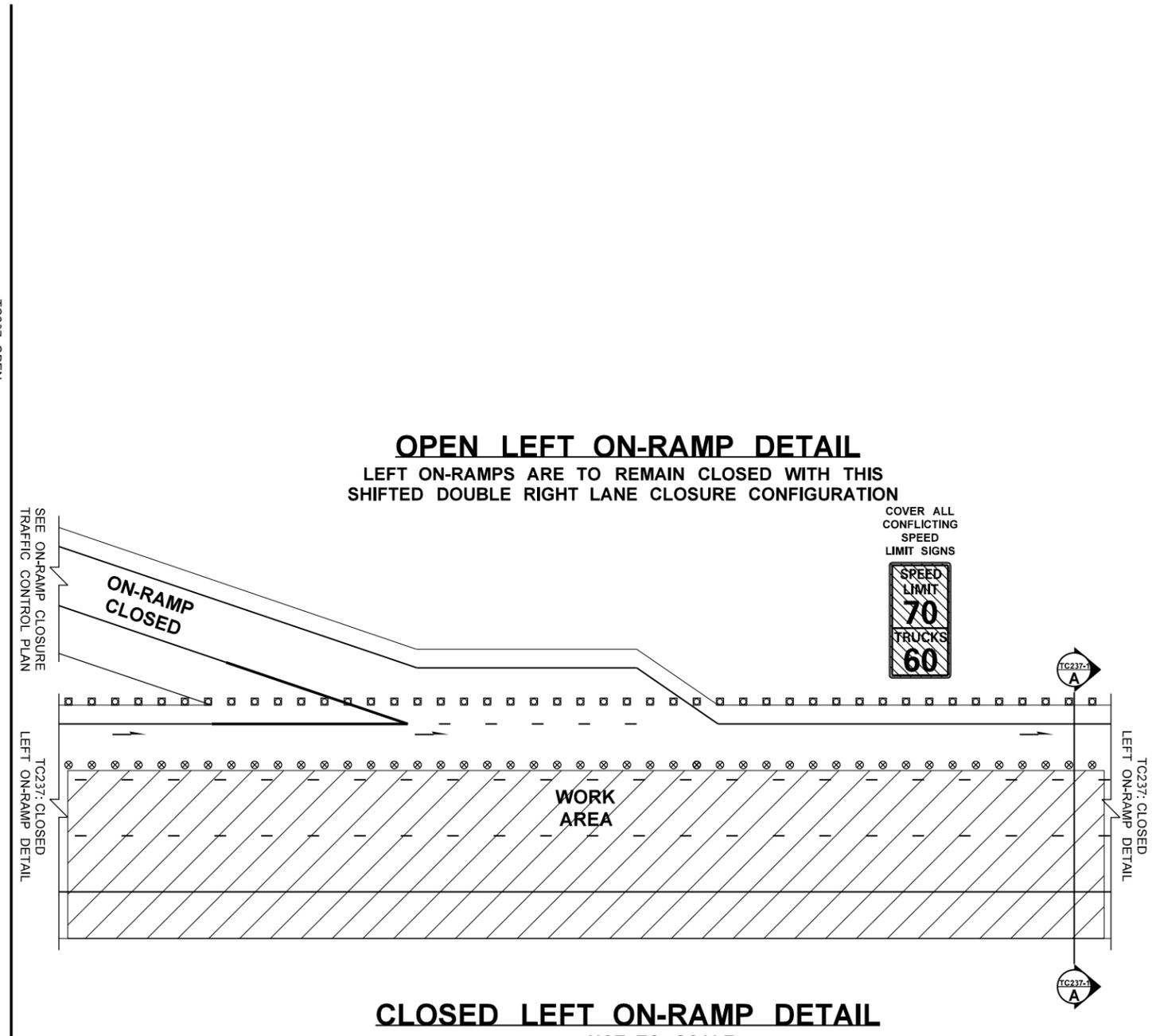
FILE NAME	C:\Users\LintzF\Desktop\Work Zone TCPs\237Fwy2RtLanes5MaxLtShift70to55WZSL40Adv.dgn	REGION NO.	STATE	FED.AID PROJ.NO.	<p>Washington State Department of Transportation</p>	Plot 2
TIME	1:57:59 PM	10	WASH			PLAN REF NO TC237
DATE	4/30/2019	JOB NUMBER				SHEET 2
PLOTTED BY	LintzF	CONTRACT NO.				OF 3
DESIGNED BY	HAAPALA & LINTZ	LOCATION NO.				SHEETS
ENTERED BY	F. LINTZ					
CHECKED BY	S. HAAPALA					
PROJ. ENGR.						
REGIONAL ADM.		REVISION	DATE	BY		

NOTES:

1. FOR LEGEND, TABLES, AND ADDITIONAL NOTES: SEE TC237, SHEET 1.



OPEN LEFT EXIT-RAMP DETAIL
NOT TO SCALE



CLOSED LEFT ON-RAMP DETAIL
NOT TO SCALE

CLOSED LEFT EXIT-RAMP DETAIL
LEFT EXIT-RAMPS ARE TO REMAIN OPEN WITH THIS SHIFTED DOUBLE RIGHT LANE CLOSURE CONFIGURATION

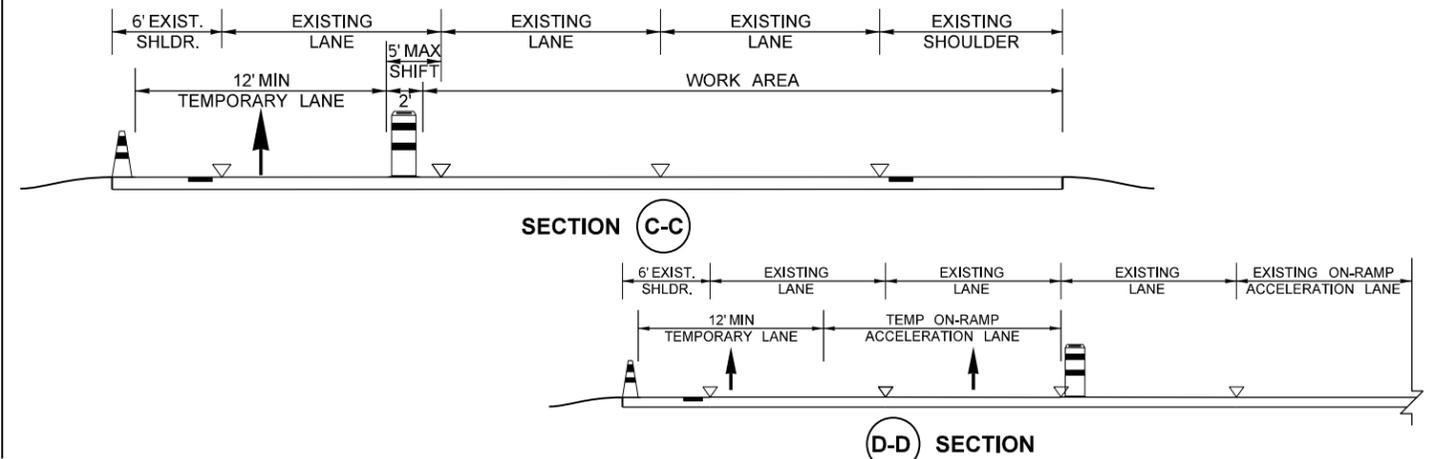
**FREEWAY (3 LANES): DOUBLE RIGHT LANE CLOSURE WITH 5' MAX SHIFT ONTO LEFT SHOULDER
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TIME	1:57:59 PM				10	WASH			PLAN REF NO TC237
DATE	4/30/2019				JOB NUMBER			TYPICAL TRAFFIC CONTROL PLANS	SHEET 3 OF 3 SHEETS
PLOTTED BY	LintzF				CONTRACT NO.	LOCATION NO.			
DESIGNED BY	HAAPALA & LINTZ								
ENTERED BY	F. LINTZ								
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PROJ. ENGR.									
REGIONAL ADM.		REVISION	DATE	BY					

DESIGNER NOTES:

- A. SEE WSDOT PROJECT DELIVERY MEMO 19-01 IN REGARDS TO FREEWAY WORK ZONE VARIABLE REGULATORY SPEED LIMIT AND ADVISORY SPEED IMPLEMENTATION. IN ADDITION, SEE WSDOT EXECUTIVE ORDER E1060.02 IN REGARDS TO APPROVAL AUTHORITY INFORMATION FOR VARIABLE REGULATORY AND ADVISORY SPEEDS IN WORK ZONES. CONTACT WSDOT REGION TRAFFIC OFFICES FOR ADDITIONAL INFORMATION.
- B. THESE TRAFFIC CONTROL PLANS ARE TYPICAL AND MAY BE MODIFIED FOR SITE SPECIFIC SITUATIONS AND/OR WSDOT REGION TRAFFIC PRACTICES. CONTACT WSDOT REGION TRAFFIC OFFICES FOR ANY MODIFICATIONS OF THE WORK ZONE VARIABLE REGULATORY SPEED LIMIT OR ADVISORY SPEED.
- C. THE SIGN SIZES SHOWN ARE TYPICAL AND MEET MINIMUM SIZES REQUIRED PER MUTCD ON FREEWAYS FOR TEMPORARY TRAFFIC CONTROL.
- D. IN REGARDS TO ADVANCED WARNING SIGN SPACING: PER MUTCD SECTION 6C.04 PARAGRAPH 06, TABLE 6-1 (TABLE 6-1 HAS BEEN MODIFIED PER WAC 468-95-300) ARE RECOMMENDED DISTANCES AND INTENDED FOR GUIDANCE PURPOSES ONLY AND SHOULD BE ADJUSTED FOR FIELD CONDITIONS. REDUCING FREEWAY SIGN SPACING TO 1000' +/- IS ACCEPTABLE. A MINIMUM SPACING OF 500' +/- SHOULD BE USED ON FREEWAY MAINLINES ONLY WHEN NECESSARY. ADVISORY SIGNS AND RADAR SPEED DISPLAY SIGNS CAN BE SPACED AT 300' +/-.
- E. PER WAC 468-95-300, ALL SIGN SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERCHANGE RAMPS. ON-RAMP SPACING IS TYPICALLY 200' +/-, EVEN IN SUBURBAN AND RURAL AREAS, BUT CAN BE REDUCED AS NEEDED TO FIT.
- F. WHEN POSITIONED BEHIND CHANNELIZATION DEVICES, TEMPORARY SIGNS SHOULD BE MOUNTED AT 5' MINIMUM.
- G. PER MUTCD 6H-33, USING PCMS FOR FREEWAY LANE CLOSURES IS NOT REQUIRED. PCMS 1 IS OPTIONAL AND INTENDED ONLY TO BE USED WHEN WORK ZONE TRAFFIC QUEUES ARE EXPECTED TO EXTEND BEHIND THE W20-1 SIGN. FOR ADDITIONAL INFORMATION REGARDING ACTIVE QUEUE DETECTION TECHNOLOGY, CONTACT STEVE HAAPALA (HAAPALA@WSDOT.WA.GOV) OR FRED LINTZ (LINTZF@WSDOT.WA.GOV). PCMS 2 IS RECOMMENDED; FREEWAY LANE CLOSURES DO NOT REQUIRE A PCMS. PCMS 3 IS OPTIONAL TO HIGHLIGHT EXIT-RAMP CLOSURES. PCMS 4 IS RECOMMENDED WHEN SPACE ALLOWS ALONG OPEN ON-RAMPS WHENEVER MAINLINE TRAFFIC SHIFTED ONTO SHOULDER.
- H. THE RADAR SPEED DISPLAY SIGN (RSDS) IS REQUIRED FOR FREEWAY LANE CLOSURES WHEN A SINGLE OPEN LANE IS SHIFTED ONTO THE SHOULDER.
- I. WARNING LIGHTS ON CHANNELIZATION DEVICES ARE OPTIONAL; CONTACT REGION TRAFFIC OFFICES FOR THEIR POLICY. TYPICAL TRAFFIC CONTROL PLANS DO NOT SHOW WARNING LIGHTS ON CHANNELIZATION DEVICES BASED ON RECOMMENDATIONS FROM TRANSPORTATION RESEARCH BOARD REPORT 2458 PAGE 65-73 AND FHWA REPORT FHWA-ICT-13-029.
- J. CHANNELIZATION DEVICES MAY BE MODIFIED FROM THOSE SHOWN ON THESE TYPICAL PLANS. PER MUTCD, THE MINIMUM REQUIRED DEVICE ON HIGH-SPEED ROADWAYS IS A 28" REFLECTIVE CONE.
- K. VERTICAL PANEL CHANNELIZATION DEVICES SHALL NOT BE USED.
- L. CHANNELIZATION DEVICE SPACING TABLE IS BASED ON WAC 468-95-301; HOWEVER, DEVICE SPACING MAY BE REDUCED.
- M. TAPER LENGTHS ARE BASED ON MUTCD TABLES 6C-3 AND 6C-4. TAPER LENGTHS SHALL MEET OR EXCEED THIS SPECIFIED RATE WITHOUT EXCEPTION. THE TAPER DISTANCES PROVIDED ON THIS TYPICAL TRAFFIC CONTROL PLAN WERE BASED ON THE ASSUMPTION OF 12' LANES. BECAUSE SHOULDER WIDTHS VARY, A SHOULDER CLOSURE TAPER TABLE IS INCLUDED TO ADDRESS VARIOUS WIDTHS. LANE SHIFT TAPER DISTANCES PROVIDED WERE BASED ON A 5-FOOT MAXIMUM SHIFT.
- N. PER MUTCD FIGURE 6H-33, SEQUENTIAL ARROW BOARDS SHALL BE USED FOR ALL FREEWAY LANE CLOSURE TAPERS. EACH LANE CLOSURE SHALL HAVE A SEPARATE SEQUENTIAL ARROW BOARD. SEQUENTIAL ARROW BOARDS SHALL NOT BE USED FOR LANE SHIFTS, RAMP SHIFTS, OR AT ON-RAMP MERGES.
- O. THE "2L" TANGENT BETWEEN LANE CLOSURE TAPERS MAY BE REDUCED TO "L" IN TIGHT GEOMETRIC SITUATIONS, BUT "2L" SHOULD BE OBTAINED WHEN POSSIBLE.
- P. PER MUTCD FIGURE 6H-33, LONGITUDINAL BUFFER SPACES ARE OPTIONAL. THEIR USE IS RECOMMENDED WHEN FEASIBLE. IF THE DESIGN BUFFER IS NOT AVAILABLE, THE BUFFER SHOULD BE MAXIMIZED. THE BUFFER CAN EXCEED THE DESIGN BUFFER DISTANCE (THUS "MIN" IS USED).
- Q. THE TRANSVERSE BUFFER (LATERALLY BETWEEN TRAVEL LANE AND WORK AREA) IS RECOMMENDED AS 2-FOOT BUT MAY BE INCREASED AS DESIRED.
- R. PER MUTCD FIGURE 6H-33, TRANSPORTABLE ATTENUATORS ARE OPTIONAL BUT THEIR USE IS STRONGLY RECOMMENDED FOR FREEWAY LANE CLOSURES. TRANSPORTABLE ATTENUATOR SHOULD BE PLACED IN CLOSED LANE ADJACENT TO TRAFFIC PRIOR TO SEPARATE WORK AREAS, PARTICULARLY AFTER OPEN TEMPORARY EXIT-RAMPS AND OPEN TEMPORARY ON-RAMPS. EITHER PROTECTIVE VEHICLES OR TRANSPORTABLE ATTENUATORS CAN BE PLACED IN THE ADDITIONAL CLOSED LANES EXCEPT THE CLOSED LANE ADJACENT TO TRAFFIC.

- S. PLACING CHANNELIZATION DEVICES TRANSVERSELY (AT 45° AND 5-FOOT SPACING) IS AN EFFECTIVE TECHNIQUE TO MOVE ERRANT DRIVERS BACK OUT OF CLOSED LANES AND SHOULDERS.
- T. TEMPORARY SIGNS CAN BE PLACED ADJACENT TO THE PAVED RIGHT SHOULDER (SIGN IS NOT TO PROTRUDE INTO TRAVEL WAY) INSTEAD OF WITHIN THE CLOSED LANES IF CONFLICTING WITH WORK OPERATIONS.
- U. PER MUTCD FIGURE 6H-33, THE REOPENING TAPER IS OPTIONAL.
- V. A TAPERED TEMPORARY EXIT-RAMP IS TYPICALLY USED WITH A TYPICAL 20:1 TAPER RATE.
- W. THE ON-RAMP SHIFT CAN OCCUR THROUGH THE PAVED GORE INSTEAD AT THE END OF THE GORE PAVEMENT MARKINGS.
- X. WHEN SHIFTING TRAFFIC ONTO PAVED SHOULDER OR ACROSS PAVED RAMP GORES, VERIFY CROSS-SLOPE IS TRAVERSIBLE, PAVEMENT THICKNESS IS ADEQUATE, CATCH BASINS/ITS BOXES ARE TRAFFIC BEARING TYPES.
- Y. A PARALLEL TEMPORARY ON-RAMP IS TYPICALLY USED. THE PARALLEL TEMPORARY ON-RAMP IS BASED ON WSDOT DESIGN MANUAL EXHIBIT 1360-13b. THE ON-RAMP IS SHIFTED ACROSS EACH CLOSED LANES AT L/2 PER CLOSED LANE SHIFT RATE THEN AN ACCELERATION TANGENT OF L/2 IS FOLLOWED BY AN L/2 ON-RAMP MERGE TAPER. IT IS IMPORTANT TO UNDERSTAND MUTCD FIGURE 6H-44 TYPICAL APPLICATION IS GUIDANCE PER MUTCD SECTION 6H.01.
- Z. TO DISCOURAGE WORK ZONE INTRUSIONS, DEVICE SPACING IS REDUCED BY HALF ACROSS CLOSED EXIT-RAMPS BETWEEN THE "EXIT CLOSED" SIGN AND THE END OF THE EXIT-RAMP'S PAVED GORE.
- AA. ACTUAL WORK AREA LIMITS CAN BE MODIFIED.
- BB. RAMP DETOUR SIGNAGE IS RECOMMENDED BY MUTCD 6C.09. IT IS RECOMMENDED TO USE ROUTE SPECIFIC DETOUR SIGNAGE FOR SIGNIFICANT RAMP CLOSURES.
- CC. THE ROUTE SPECIFIC DETOUR ROUTE SIGN INCLUDES EITHER AN INTERSTATE SHIELD (FOR FREEWAY RAMPS), HIGHWAY SHIELDS (FOR STATE HIGHWAY RAMPS), OR ROADWAY DESCRIPTION. IF THE RAMP IS TO A SPECIFIC ROUTE DIRECTION, INCLUDE ITS DIRECTION. MAXIMIZE THE SHIELDS, TEXT SIZE, AND ARROWS TO FIT ON THE 48"x48" SIGN.
- DD. THE CHANNELIZATION DEVICE IS SHOWN ON THE GRADE ADJACENT TO THE 4-FOOT LEFT SHOULDER TO MAXIMIZE WORK AREA. WHEN 6' LEFT SHOULDERS ARE PRESENT, THE CHANNELIZATION DEVICE SHOULD BE MOVED BACK ONTO THE SHOULDER PAVEMENT AT ITS EDGE. CROSS SECTIONS "C-C" AND "D-D" ARE SHOWN BELOW.
- EE. FOR FREEWAYS WITH LEFT SHOULDERS 8-FEET OR WIDER, SEPARATE TYPICAL TRAFFIC CONTROL PLANS FOR 9-FOOT MAX LEFT SHOULDER SHIFTS ARE PROVIDED IN THE WORK ZONE LIBRARY
- FF. THIS TRAFFIC CONTROL PLAN IS NOT APPLICABLE WHEN HOV-RESTRICTED LANES ARE PRESENT. FOR FREEWAYS WITH LEFT LANE HOV RESTRICTIONS, SEPARATE TYPICAL TRAFFIC CONTROL PLANS ARE PROVIDED IN THE WORK ZONE LIBRARY. FOR UNIQUE HOV LANE CONFIGURATIONS (SUCH AS HOV LANE-CHANGE RESTRICTIONS INCLUDING A BUFFER SEPARATION, DIRECT-ACCESS HOV RAMPS, OR RIGHT LANES THAT ARE HOV-RESTRICTED) CONTACT REGION TRAFFIC OFFICE WHEN DEVELOPING PLANS.
- GG. THIS TRAFFIC CONTROL PLAN IS NOT APPLICABLE WHEN EXPRESS TOLL LANE(S) PRESENT. FOR FREEWAYS WITH EXPRESS TOLL LANE(S), CONTACT REGION TRAFFIC OFFICE WHEN DEVELOPING PLANS.



**FREEWAY (3 LANES): DOUBLE RIGHT LANE CLOSURE WITH 5' MAX SHIFT ONTO LEFT SHOULDER
(70 MPH TO 55 MPH VARIABLE WORK ZONE SPEED LIMIT REDUCTION, 40 MPH ADVISORY SPEED)
NOT TO SCALE**

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Washington State
Department of Transportation

DESIGNER GUIDANCE