



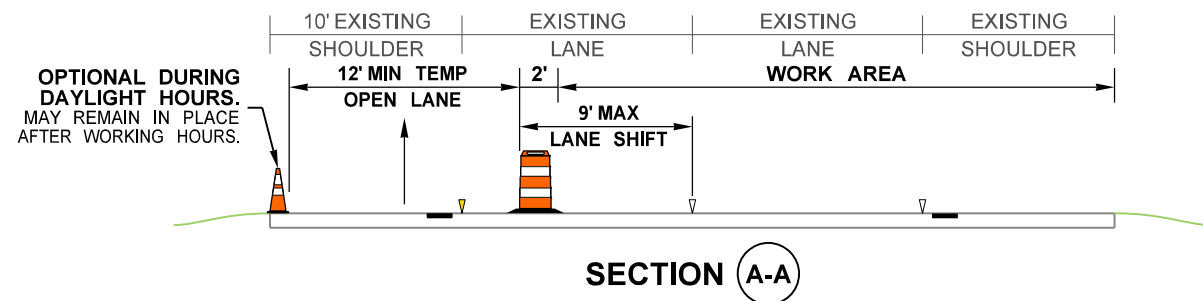
3-MILE QUEUE WARNING SYSTEM MESSAGES					
TRAFFIC SENSORS		PCMS 2		PCMS 1	
B	A	1	2	1	2
TRIGGER	SPEED	2.0 SEC	2.0 SEC	2.0 SEC	2.0 SEC
35+ MPH	35+ MPH	RIGHT LANE CLOSURE	3 MILES AHEAD	ROADWAY NARROWS 12' WIDE	SHOULDER DRIVING AHEAD
35+ MPH	< 35 MPH	LANE CLOSURE 3 MILES	ROADWAY NARROWS 12' WIDE	SLOW OR STOPPED TRAFFIC	NEXT 1.5 MILES
< 35 MPH	< 35 MPH	SLOW OR STOPPED TRAFFIC	NEXT 3 MILES	USE ALL LANES	TAKE TURNS AT MERGE

SEE QUEUE WARNING SYSTEM SPECIAL PROVISION OR RFP FOR DETAILS.

LOCATE PCMSs PER STD. SPEC. 1-10.3(3)C. PCMS MAY BE PLACED ON OPPOSITE SHOULDER WHEN NEEDED, BUT AVOID RAMP GORES. WHEN PCMSs OR TRAFFIC SENSORS PLACED BEHIND BARRIER/GUARDRAIL OR WITHIN CLOSED LANE, TRANSVERSE TRAFFIC DRUMS ARE NOT REQUIRED.

ADJUST QWS COMPONENTS AS NEEDED TO AVOID CONFLICTS WITH TRAFFIC CONTROL DEVICES, NARROW SHOULDERS, RAMPS, OR TO MAINTAIN VISIBILITY OF SEQUENTIAL ARROW SIGN.

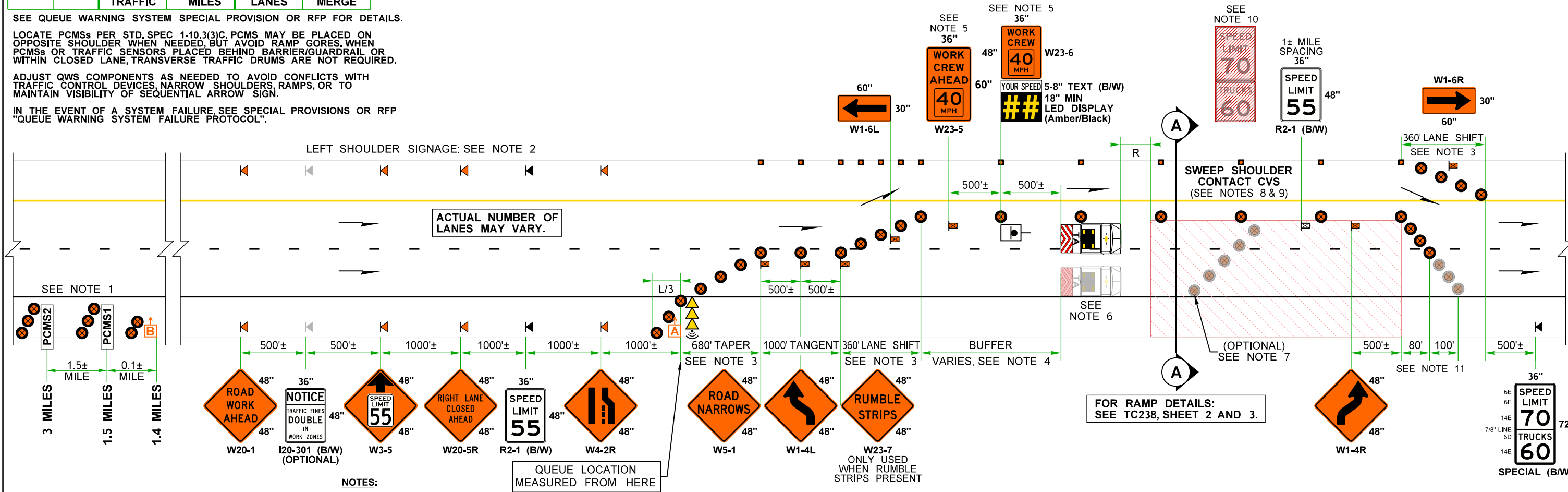
IN THE EVENT OF A SYSTEM FAILURE, SEE SPECIAL PROVISIONS OR RFP "QUEUE WARNING SYSTEM FAILURE PROTOCOL".



SHOULDER CLOSURE TAPER LENGTH = L/3	
SHOULDER WIDTH	L/3
< 6'	80'
6'	120'
10'	200'

STATIONARY TRANSPORTABLE ATTENUATOR ROLL AHEAD DISTANCE = R	
HOST VEHICLE WEIGHT	R
LESS THAN 22,000 lbs.	123'
22,000+ lbs.	100'

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



NOTES:

- miniPCMS PERMITTED ON 2-LANE FREEWAYS.
- ON 2-LANE FREEWAYS, LEFT SHOULDER SIGNAGE OPTIONAL IF PAVED SHOULDER WIDTH IS LESS THAN 6 FEET.
- IF FEASIBLE, AVOID PLACING LANE CLOSURE OR LANE SHIFT TAPERS WITHIN OR IMMEDIATELY FOLLOWING HORIZONTAL CURVES.
- BUFFER SPACE MAY BE ADJUSTED (±) BASED ON FIELD CONDITIONS. DISTANCE INCREASES AS WORK AREA MOVES DOWNSTREAM.
- RELOCATE W23-6 & RSDS AS WORK ZONE MOVES DOWNSTREAM. IF ENGINEER ACCEPTS, ADDITIONAL W23-6 & RSDS MAY BE ADDED PRIOR TO EACH WORK CREW.
- RED/WHITE OR BLACK/YELLOW CHEVRON PATTERN OK. SECOND TRANSPORTABLE ATTENUATOR IN RIGHT LANE IS OPTIONAL. ADDITIONAL TRANSPORTABLE ATTENUATORS MAY BE ADDED BEHIND EACH WORK CREW.

- IF USED, PLACE DEVICES TRANSVERSELY ACROSS CLOSED LANES AT 45°± AND 5' SPACING AT STRATEGIC LOCATIONS.
- CONTACT WSDOT COMMERCIAL VEHICLE SERVICES (360-704-6340) AT LEAST 7 DAYS IN ADVANCE OF ROADWAY WIDTH RESTRICTIONS.
- WHEN SHOULDER NARROWS, USE LANE SHIFT (40:1 SHIFT TAPER @ 16' MIN WIDTH) WITH W1-4 SIGN (5' MIN) 500'± PRIOR TO SHIFT AND W1-6 SIGN AT SHIFT TAPER.
- COVER ALL CONFLICTING SIGNAGE PER STD. SPEC. 1-10.3(3)A. BLACK 1/8" ABS OR 1/4" PLYWOOD TEMP. SIGN COVER PERMITTED.
- DOWNSTREAM TAPER OPTIONAL ACROSS RIGHT LANE, BUT FIRST 80' REQUIRED. DOWNSTREAM TAPER DEVICE SPACING IS 20'.
- SIGNS ARE BLACK ON ORANGE UNLESS OTHERWISE INDICATED.

- PLAN IS APPLICABLE TO LANE CLOSURES OF 7 DAYS OR LESS.
- NOTIFY PUBLIC OF SPEED REDUCTION AT LEAST 3 DAYS PRIOR VIA PCMS: 55 MPH WZ SPEED LIMIT / BEGINS DAYOFWEEK MM/DD/YY @ 2.0 SEC.
- ADD W21-30-SERIES SIGNS (48"x48", 5' HEIGHT) 500'± PRIOR TO FREQUENT CONSTRUCTION VEHICLES INGRESS/EGRESS INTO THE OPEN LANE(S).
- BICYCLIST ACCOMMODATIONS, WHERE FACILITY OPEN TO BICYCLES:  
(A) BICYCLES PROHIBITED VIA R5-601 & R5-6 SIGNS. PROVIDE SIGNED DETOUR OR ALTERNATIVE ROUTE.  
(B) BICYCLES PROHIBITED VIA R5-601 & R5-6 SIGNS. PROVIDE FREE SHUTTLE (WORK TRUCK, VAN, OR BUS OK) + CONTACT INFORMATION OR PHONE BOX.  
(C) ENGINEER TO ACCEPT ANY ALTERNATIVE STRATEGIES.



LEGEND:	
	TEMPORARY SIGN LOCATION (1' MIN HEIGHT)
	TEMPORARY SIGN LOCATION (5' MIN HEIGHT)
	28" TRAFFIC CONE
	TRAFFIC SAFETY DRUM
	QWS TRAFFIC SENSOR
	RADAR SPEED DISPLAY SIGN (RSDS)
	SMART SEQUENTIAL ARROW SIGN (CONNECTED)
	TRANSPORTABLE ATTENUATOR
	PORTABLE CHANGEABLE MESSAGE SIGN

**FREEWAY (2 LANES): SINGLE RIGHT LANE CLOSURE, 9' MAX LEFT SHOULDER SHIFT (55 MPH WORK ZONE SPEED LIMIT, 40 MPH ADVISORY SPEED)**

NOT TO SCALE




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TIME 7:51:47 AM												PLAN REF NO TC238	
DATE 1/8/2024												SHEET 1B OF 3 SHEETS	
DESIGNED BY LintzF												TYPICAL TRAFFIC CONTROL PLANS	
ENTERED BY													
CHECKED BY													
PROJ. ENGR.													
REGIONAL ADM.													
REVISION		DATE		BY									

FILE NAME C:\Users\LintzF\OneDrive - Washington State Department of Transportation\Desktop\Work Zone TCPs\238Fwy1RtLanes9MaxLtShift70to55WZSL40Adv.dgn										<div><p>Washington State Department of Transportation</p></div>		Plot 3	
TIME	7:51:48 AM				REGION NO.	STATE	FED.AID PROJ.NO.					PLAN REF NO	
DATE	1/8/2024				10	WASH				TC238			
PLOTTED BY	LintzF				JOB NUMBER			<div></div>					
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PROJ. ENGR.					CONTRACT NO.			LOCATION NO.					
REGIONAL ADM.													
REVISION		DATE	BY	P.E. STAMP BOX			DATE	P.E. STAMP BOX					

FILE NAME C:\Users\LintzF\OneDrive - Washington State Department of Transportation\Desktop\Work Zone TCPS\238Fwy1Rt\lanes9MaxLtShft70to55WZSL40Adv.dgn										Plot 4	
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DATE	1/8/2024				10	WASH				TC238	
PLOTTED BY	LintzF				JOB NUMBER						
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PROJ. ENGR.										3	
REGIONAL ADM.										SHEETS	
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FILE NAME C:\Users\LintzF\OneDrive - Washington State Department of Transportation\Desktop\Work Zone TCPS\238Fwy1RtLanes9MaxLtShlft70to55WZSL40Adv.dgn										Plot 5	
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DATE 1/8/2024						10		WASH			
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Washington State  
Department of Transportation

TYPICAL TRAFFIC CONTROL PLANS

DATE

P.E. STAMP BOX

DATE

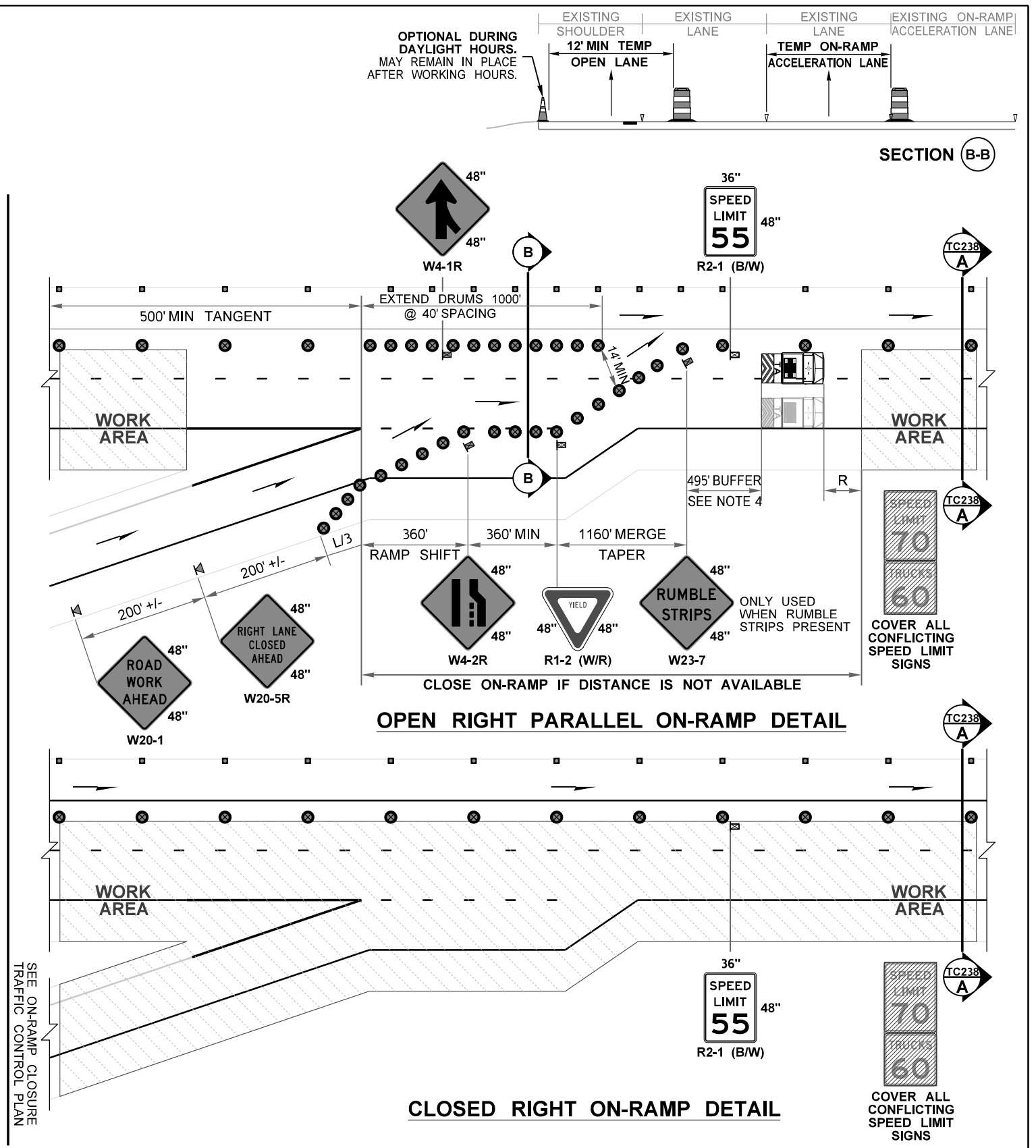
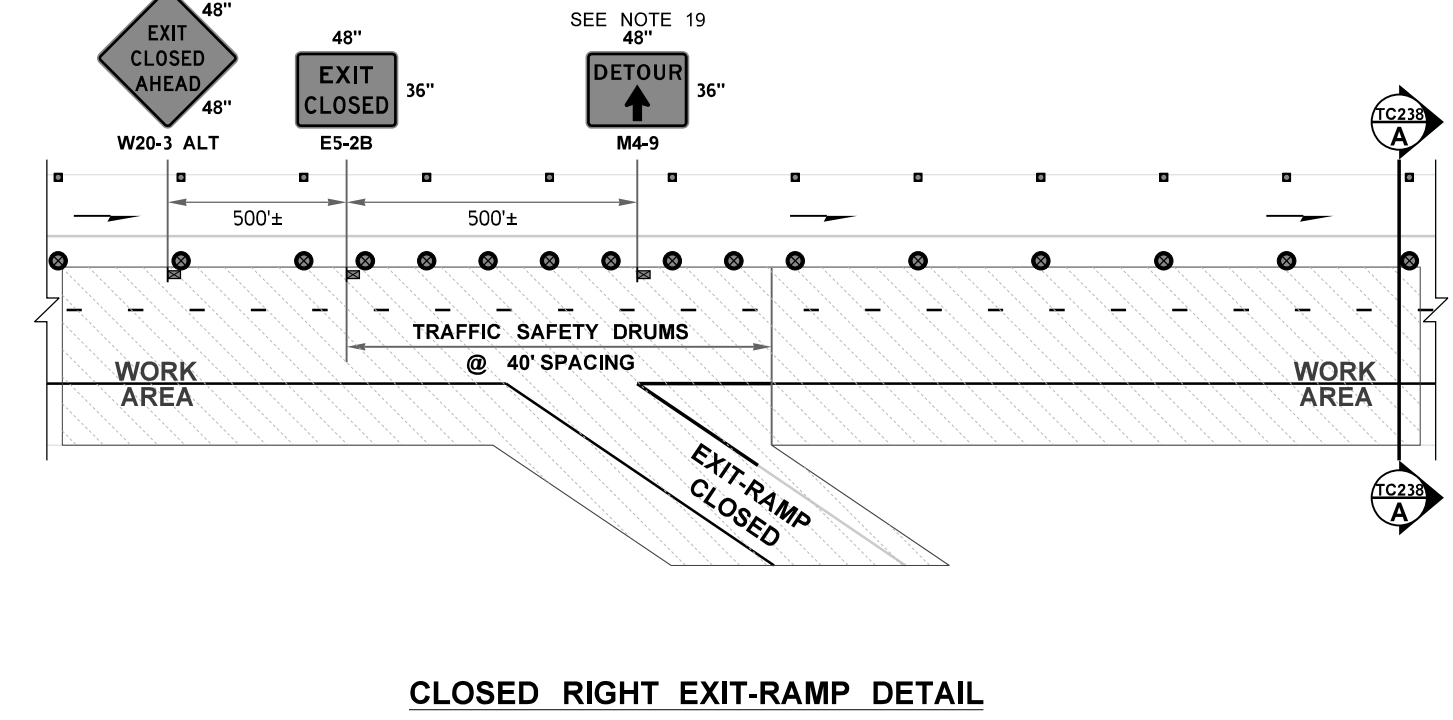
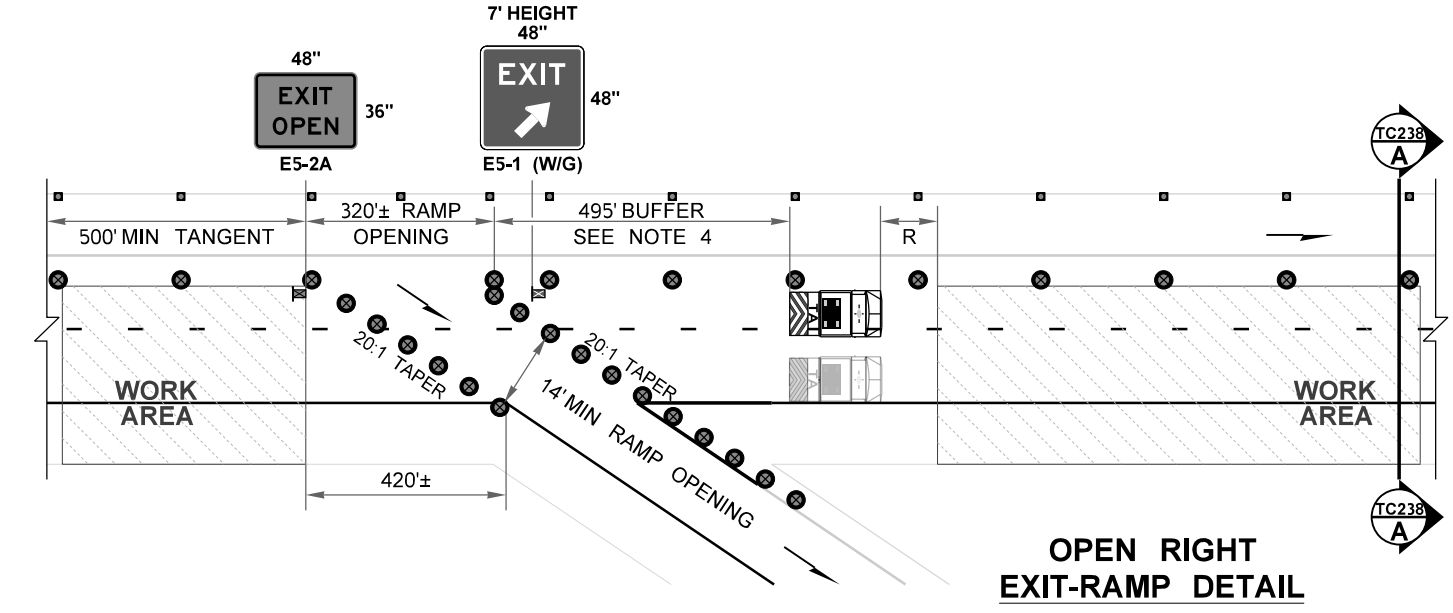
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- NOTES:**
17. FOR LEGEND, TABLES, AND ADDITIONAL NOTES: SEE TC238, SHEET 1A OR 1B.
18. FOR RIGHT RAMP DETAILS FOR A SINGLE RIGHT LANE CLOSURE (WITHOUT SHOULDER SHIFT) SEE TC107, SHEET 2A. ADD R2-1 (55) SIGN AFTER ON-RAMP MERGES NEAR COVERED EXISTING SPEED LIMIT SIGN.
19. SEE DETOUR PLAN FOR ADDITIONAL RAMP CLOSURE DETOUR SIGNAGE.




**FREEWAY (2 LANES): SINGLE RIGHT LANE CLOSURE, 9' MAX LEFT SHOULDER SHIFT (55 MPH WORK ZONE SPEED LIMIT, 40 MPH ADVISORY SPEED)**

NOT TO SCALE

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DESIGNED BY													
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REVISION		DATE	BY	P.E. STAMP BOX			P.E. STAMP BOX			TYPICAL TRAFFIC CONTROL PLANS			

FILE NAME C:\Users\LintzF\OneDrive - Washington State Department of Transportation\Desktop\Work Zone TCPS\238Fwy1RtLanes9MaxLtShlft70to55WZSL40Adv.dgn										Plot 5	
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DATE 1/8/2024						10		WASH			
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DESIGNED BY										 <b>Washington State</b> <b>Department of Transportation</b>	
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REGIONAL ADM.											
		REVISION		DATE		BY				SHEET 3 OF 3 SHEETS	
										TYPICAL TRAFFIC CONTROL PLANS	

**WORK ZONE MICROSTATION CELLS: Updated work zone cells incorporated (January 2024).**

WSDOT CAE automatically updates cell libraries on WSDOT and on-site consultant staff computers (no action needed); however, external users or off-site consultants must manually install them. For additional information e-mail HQCAEHlpDesk@wsdot.wa.gov.

Division 4 in WSDOT Plans Preparation Manual, Section 400.06(29), provides updated work zone cell library policy and information for PS&Es. See <https://wsdot.wa.gov/engineering-standards/all-manuals-and-standards/manuals/plans-preparation-manual>

**OTHER TYPICAL TCP VERSION EXPLANATION:**

TC236 provides 4' max shift alternative of this plan for a typical 2-lane rural freeway configuration with 4' left shoulder.

**PLOT USAGE EXPLANATION:**

- Plot 1:** Single open lane shifted onto left shoulder (9' max), via single right lane closure, with 55-mph work zone speed limit and 40-mph work crew advisory speed including a single PCMS in advance for queue mitigation.
- Plot 2:** 3-Mile Queue Warning System version of single open lane shifted onto left shoulder (9' max), via single right lane closure, with 55-mph work zone speed limit and 40-mph work crew advisory speed.
- Plot 3:** Right ramp details, including parallel on-ramp, within single open lane shifted onto left shoulder (9' max) with 55-mph work zone speed limit.
- Plot 4:** Right ramp details, including tapered on-ramp, within single open lane shifted onto left shoulder (9' max) 55-mph work zone speed limit.
- Plot 5:** Left ramp details within single open lane shifted onto left shoulder (9' max) with 55-mph work zone speed limit.

**OTHER QUEUE MITIGATION PLANS: Available in Typical Traffic Control Plan Library**  
(<https://wsdot.wa.gov/engineering-standards/all-manuals-and-standards/plan-sheet-library/work-zone-typical-traffic-control-plans-tcp>)

- 6-Mile Queue Warning System:** Plan now separated; see TC157.
- 6-Mile Smart Work Zone System:** See TC167.
- 9-Mile Smart Work Zone System:** See TC177.

**DESIGNER NOTES:**

- A. Contact Region Transportation Operations to determine if a queuing mitigation system is needed; and if so, which one is appropriate.
- B. Contact Region Transportation Operations to determine if Parallel (Sheet 2A) and/or Tapered (Sheet 2B) temporary left on-ramps are used.
- C. This Typical TCP is not applicable when HOV-restricted or Express Toll Lane(s) are present. Contact Region Transportation Operations for additional guidance.
- D. Per WSDOT Executive Order E1060 (<https://wwwi.wsdot.wa.gov/publications/policies/fulltext/1060.pdf>); speed limit reductions and advisory speeds must be approved for work zones. Submit speed reduction reductions & advisory speed requests for work zones through WSDOT Region Transportation Operations. See Traffic Manual Section 5-18 for additional information for documentation and notification requirements.
- E. These typical traffic control plans (Typical TCPs) may be modified for project-specific, site-specific situations, and/or WSDOT Region Transportation Operations standard practices. Typical TCPs are not "Standard Plans".
- F. Portable Changeable Message Signs (PCMSs) are optional per MUTCD Section 6F.60 and Section 6H and are used to supplement signage and inform motorists of unexpected situations. Thus, if no work zone congestion or queuing is expected, the two PCMS-ALT messages can be deleted but keep the PCMS since traffic is shifted into paved shoulder. Modify all "ROADWAY NARROWS 12' WIDE" PCMS message to match the actual minimum travel width (shy + lane width + shoulder) available through the work zone.
- G. 48"x48" diamond-shaped work zone signs used on freeway mainlines and ramps. Per MUTCD 6H-33, gating temporary signs on both shoulders is Guidance on divided highways and Optional per MUTCD Section 6F.03 P02. Based on engineering judgement, signs on left shoulders is optional on 2-lane freeways with shoulders less than 6' because it is difficult for work crews to install/remove safely and is less critical to have signs gated than on 3-lane or more freeways. If signs are barrier-mounted separating 2-way traffic or on narrow shoulders, a special rectangular-shaped 24"x48" sign should be used. See MUTCD Table 6F-1 for additional temporary sign size information.

**DESIGNER NOTES (continued):**

- H. Freeway mainline sign spacing may be reduced down to 1000'+/- based on engineering judgement and down to 500'+/- if near interchanges. Along ramps, 200'+/- sign spacing typical but may be reduced farther.
- I. When positioned behind channelization devices, temporary signs should be mounted at 5' minimum. Per MUTCD 6H-42 Note 4 (Standard), a temporary "EXIT" sign shall be mounted 7' minimum when located in the temporary gore.
- J. Work zone traffic control layout for this Typical TCP is based on 55 mph regulatory work zone speed limit.
- K. Traffic safety drums required on freeway lane closure and lane shift tapers and recommended on tangents per Design Manual 1010.07. On tangents 42" tall channelization devices, 36" traffic cones, & 28" traffic cones allowable (vertical panel channelization devices prohibited). Edge of paved shoulder delineated with 28" cones at night--Oversized loads pass over cones without knocking them down, unlike with taller devices. Warning lights on channelization devices being phased out in Washington. Contact Region Transportation Operations for information regarding their standard practices.
- L. Maximum channelization device spacing table for tangents is based on WAC 468-95-301 and may ALWAYS be reduced.
- M. Sequential arrow signs (arrow boards) are required at each freeway lane closure taper per MUTCD Standard Note 6 on TA-33.
- N. Smart sequential arrow signs ("smart arrow boards") are now required on freeways in Washington on new Construction projects (existing projects can still use the conventional sequential arrow sign). Smart sequential arrow signs have communication capabilities--old arrow boards can be retrofitted--to broadcast the status of the arrow display with third-party vendors like Google Maps/Waze and Traffic Management Centers. Include the following General Special Provisions for Materials, Specification, Measurement, and Payment. <https://wsdot.wa.gov/publications/fulltext/projectdev/gspspdf/egsp1.pdf>
- \* 1-10.3(3)B(9-35.4).GR1 (Smart Sequential Arrow Sign Materials GSP)
  - \* 1-10.3(3)B(9-35.4).OPT1.2025.GR1 (Smart Sequential Arrow Sign Specifications GSP)
  - \* Measurement and Payment are still hourly per "SEQUENTIAL ARROW SIGN". No new bid item developed.
- O. Radar speed display signs are typical practice for freeway lane closures with speed limit reductions. When used, include the following General Special Provisions for Materials, Specification, Measurement, and Payment. <https://wsdot.wa.gov/publications/fulltext/projectdev/gspspdf/egsp1.pdf>
- \* 1-10.3(3).OPT2.GR1 (Radar Speed Display Sign Specification GSP)
  - \* 1-10.3(3)(9-35.8).GR1 (Radar Speed Display Sign Materials GSP)
  - \* 1-10.3(3)(9-35.8).OPT1.2025.GR1 (Radar Speed Display Sign Specifications GSP, will be placed in 2025 Standard Specifications)
  - \* 1-10.4(2).OPT3.GR1 (Radar Speed Display Sign Measurement GSP, if not Lump Sum) "HOUR"
  - \* 1-10.5(2).OPT2.GR1 (Radar Speed Display Sign Payment GSP, if not Lump Sum) "HOUR"
- P. Longitudinal buffer spaces (B) are optional per MUTCD Section 6C.06 but is desired when practical. Longitudinal buffers are the most adjustable component that may be increased/decreased to move lane closure tapers away from horizontal/vertical curves and from on-ramp merges.
- Q. The lateral buffer (transverse distance between open travel lanes and work area) is typically 2 feet on freeways. Actual work area limits may be modified.
- R. Per MUTCD Figure 6C-2, the downstream taper is optional. Eliminating it allows construction vehicles to accelerate out of work area into reopened lane to minimize traffic impacts and increase safety.
- S. A 20:1 tapered temporary exit-ramp is typical, but 15:1 is acceptable. The exit-ramp travel way width may range from 12 to 16 feet.
- T. The on-ramp shift may occur across the paved on-ramp gore at "L/2", but verify the gore's cross-slope is traversable, pavement thickness adequate, and catch basin & ITS boxes are traffic bearing types. This Typical TCP begins the ramp shift at the end of the marked gore for simplicity.
- U. Two types of temporary on-ramp configurations, parallel and tapered. Parallel on-ramp uses a L/2 per lane ramp shift, L/2 MIN acceleration pocket that may be extended when space allows, and L ramp merge taper based on MUTCD Guidance Figure 6H-44. However, a L/2 ramp merge taper is allowable based on engineering judgment, see WSDOT Design Manual Exhibit 1360-17 for guidance. Tapered on-ramp uses a single 50:1 taper (for all speeds) from the end of the marked gore to the end of the merge, see WSDOT Design Manual Exhibit 1360-16 for guidance.
- V. Ramp detour signage is recommended by MUTCD 6C.09, but using alternative routes is acceptable. Contact Region Transportation Operations for their standard practice. Recommended to use route-specific detour signage for significant ramp closures.

**FREEWAY (2 LANES): SINGLE RIGHT LANE CLOSURE, 9' MAX LEFT SHOULDER SHIFT (55 MPH WORK ZONE SPEED LIMIT, 40 MPH ADVISORY SPEED)**

	INFORMATIONAL USE ONLY	Plot 6
	DO NOT INCLUDE THIS SHEET IN CONTRACT PS&Es or TCP SUBMITTALS.	TC238
	DESIGNER GUIDANCE	