

PCMS 1	
1	2
SLOW OR STOPPED TRAFFIC	NEXT # MILES
2.0 SEC	2.0 SEC

PCMS MAY BE TRUCK-MOUNTED. (10" LETTERS OK) (3 DRUMS OPTIONAL)

FIELD LOCATE 0.5 +/- MILE IN ADVANCE OF TRAFFIC QUEUE.

= APPROXIMATE QUEUE LENGTH ROUNDED UP TO NEAREST MILE

PCMS	
1	2
LEFT LANE CLOSED	1.5 MILES AHEAD
2.0 SEC	2.0 SEC

FIELD LOCATE 1.5 +/- MILES PRIOR TO FIRST LANE CLOSURE TAPER.

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

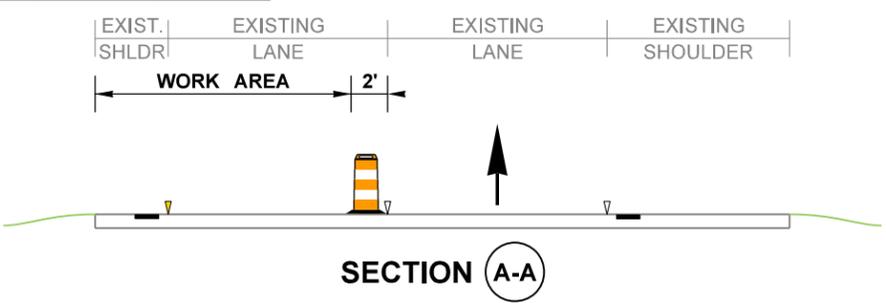
MAXIMUM CHANNELIZATION DEVICE SPACING (feet)		
MPH	TAPER	TANGENT
50-75	40	80
45	30	60

SIGN SPACING = X (1)		
FREEWAYS & EXPRESSWAYS	50-75 MPH	1500' +/-
(1) ALL SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERCHANGE RAMP.		

SHOULDER CLOSURE TAPER LENGTH = L/3								
SHOULDER WIDTH	SPEED (MPH)	45	50	55	60	65	70	75
6'	L/3 (feet)	90	120	120	120	160	160	160
		150	200	200	200	240	240	280
FOR SHOULDERS LESS THAN 6', USE 3 DEVICES MINIMUM								

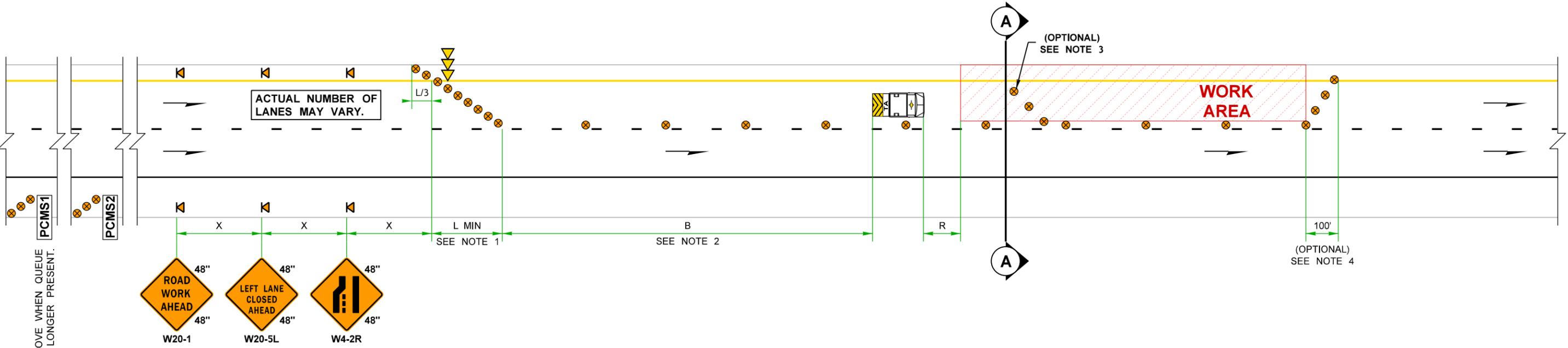
LONGITUDINAL BUFFER SPACE = B							
SPEED (MPH)	45	50	55	60	65	70	75
B (feet)	360	425	495	570	645	730	820

STATIONARY TRANSPORTABLE ATTENUATOR ROLL AHEAD DISTANCE = R			
HOST VEHICLE WEIGHT 9,900 TO 22,000 lbs.	HOST VEHICLE WEIGHT 22,001+ lbs.		
45-55 MPH	60+ MPH	45-55 MPH	60+ MPH
123'	172'	100'	150'



MINIMUM LANE CLOSURE TAPER LENGTH = L								
LANE WIDTH	SPEED (MPH)	45	50	55	60	65	70	75
12'	L (feet)	540	600	680	720	800	840	920

FOR RAMP DETAILS: SEE TC103, SHEET 2 AND 3.



NOTES:

- IF FEASIBLE, AVOID PLACING LANE CLOSURE TAPER WITHIN OR IMMEDIATELY FOLLOWING HORIZONTAL CURVES.
- DISTANCE INCREASES AS WORK AREA MOVES DOWNSTREAM.
- IF USED, PLACE DEVICES TRANSVERSELY ACROSS CLOSED LANES AT 45° +/- AND 5' SPACING AT STRATEGIC LOCATIONS.
- IF USED, REOPENING TAPER DEVICE SPACING IS 20'.
- ADD "TRUCKS LEAVING HIGHWAY" AND "TRUCKS ENTERING HIGHWAY" (W21-30, 48"x48", 5' HEIGHT) SIGNS 500' +/- PRIOR TO WHERE CONSTRUCTION VEHICLES FREQUENTLY EXIT AND ENTER INTO THE OPEN LANE(S).
- SIGNS ARE BLACK ON ORANGE UNLESS OTHERWISE INDICATED.
- PLAN IS APPLICABLE TO LANE CLOSURES OF 3 DAYS OR LESS.
- BICYCLES PROHIBITED THROUGH WORK ZONE; CONSIDER PROVIDING DETOUR, ALTERNATIVE ROUTE, OR SHUTTLE IN HIGH-USE LOCATIONS PERMITTING PERMANENT BICYCLE ACCESS.

LEGEND:

- TEMPORARY SIGN LOCATION
- TEMPORARY SIGN LOCATION (5' MIN HEIGHT)
- TRAFFIC SAFETY DRUM
- SEQUENTIAL ARROW SIGN
- TRANSPORTABLE ATTENUATOR
- PCMS PORTABLE CHANGEABLE MESSAGE SIGN

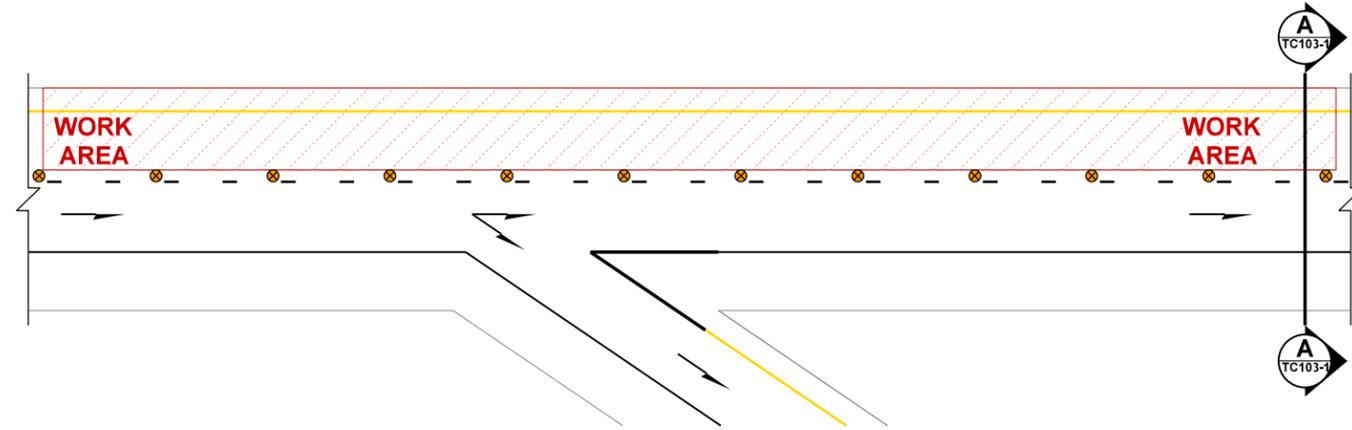
FREEWAY (2+ LANES): SINGLE LEFT LANE CLOSURE (MAINTAIN EXISTING SPEED LIMIT)

NOT TO SCALE

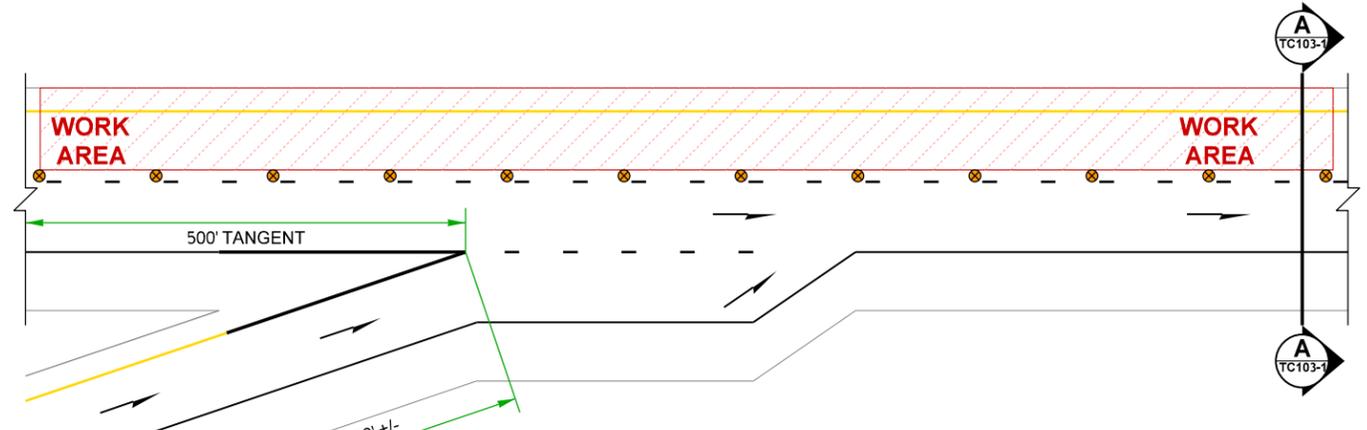
FILE NAME	C:\Users\LintzF\Desktop\Work Zone TCPs\103Fwy1LtLane.dgn			REGION NO.	STATE	FED.AID PROJ.NO.	<p>Washington State Department of Transportation</p>	Plot 1
TIME	12:28:37 PM			10	WASH			PLAN REF NO TC103
DATE	8/10/2020			JOB NUMBER				SHEET 1 OF 3 SHEETS
PLOTTED BY	LintzF			CONTRACT NO.		LOCATION NO.		
DESIGNED BY	HAAPALA & LINTZ							
ENTERED BY	F. LINTZ							
CHECKED BY	S. HAAPALA							
PROJ. ENGR.								
REGIONAL ADM.		REVISION		DATE	BY			TYPICAL TRAFFIC CONTROL PLANS

NOTES:

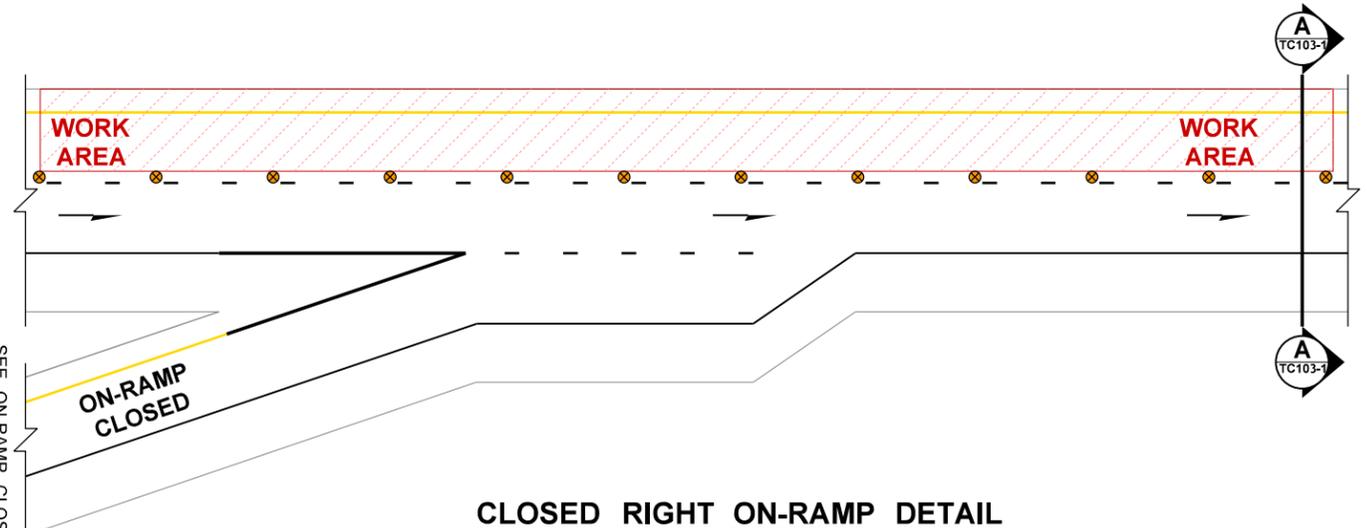
1. FOR LEGEND, TABLES, AND ADDITIONAL NOTES: SEE TC103, SHEET 1.
2. ACTUAL NUMBER OF LANES MAY VARY.



OPEN RIGHT EXIT-RAMP DETAIL



OPEN RIGHT ON-RAMP DETAIL



CLOSED RIGHT EXIT-RAMP DETAIL

RIGHT EXIT-RAMPS ARE TO REMAIN OPEN

SEE ON-RAMP CLOSURE TRAFFIC CONTROL PLAN

CLOSED RIGHT ON-RAMP DETAIL

FREEWAY (2+ LANES): SINGLE LEFT LANE CLOSURE (MAINTAIN EXISTING SPEED LIMIT)

NOT TO SCALE

FILE NAME	C:\Users\Lintz\F\Desktop\Work Zone TCPs\103Fwy1LtLane.dgn				REGION NO.	STATE	FED.AID PROJ.NO.	Washington State Department of Transportation	Plot 2
TIME	12:28:38 PM				10	WASH			PLAN REF NO TC103
DATE	8/10/2020				JOB NUMBER			TYPICAL TRAFFIC CONTROL PLANS	SHEET 2 OF 3 SHEETS
PLOTTED BY	LintzF				CONTRACT NO.	LOCATION NO.			
DESIGNED BY	HAAPALA & LINTZ								
ENTERED BY	F. LINTZ								
CHECKED BY	S. HAAPALA								
PROJ. ENGR.									
REGIONAL ADM.		REVISION	DATE	BY					

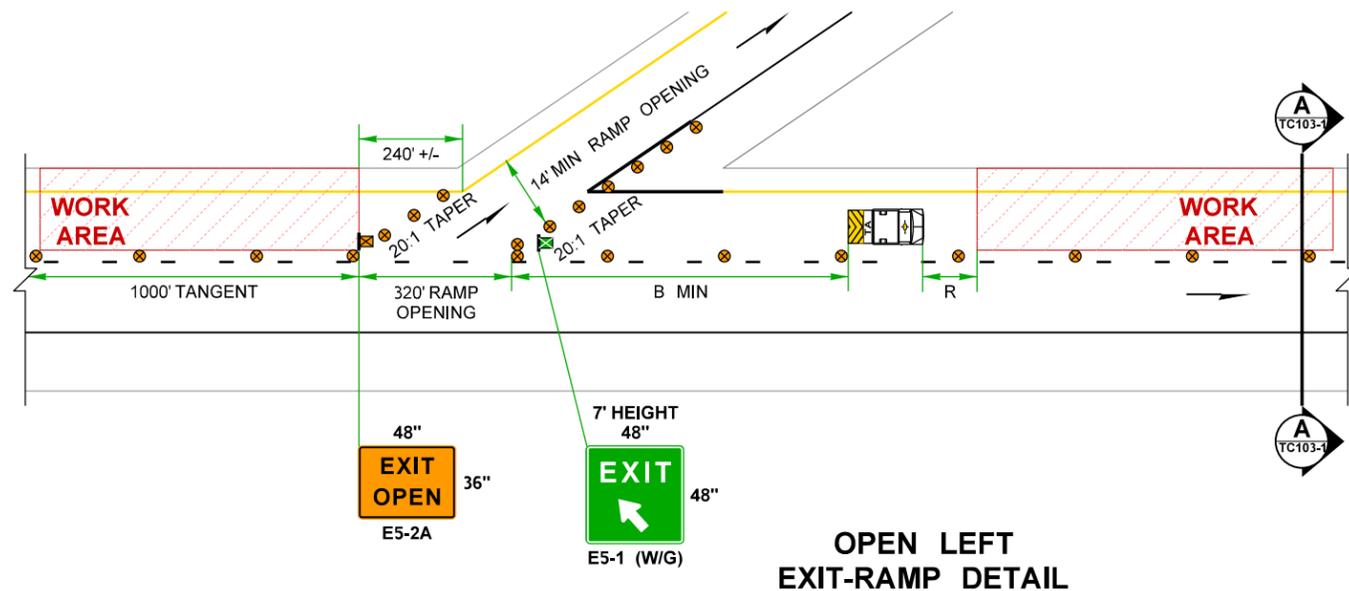
NOTES:

1. FOR LEGEND, TABLES, AND ADDITIONAL NOTES: SEE TC103, SHEET 1.
2. ACTUAL NUMBER OF LANES MAY VARY.
3. SEE DETOUR PLAN FOR ADDITIONAL RAMP CLOSURE DETOUR SIGNAGE.

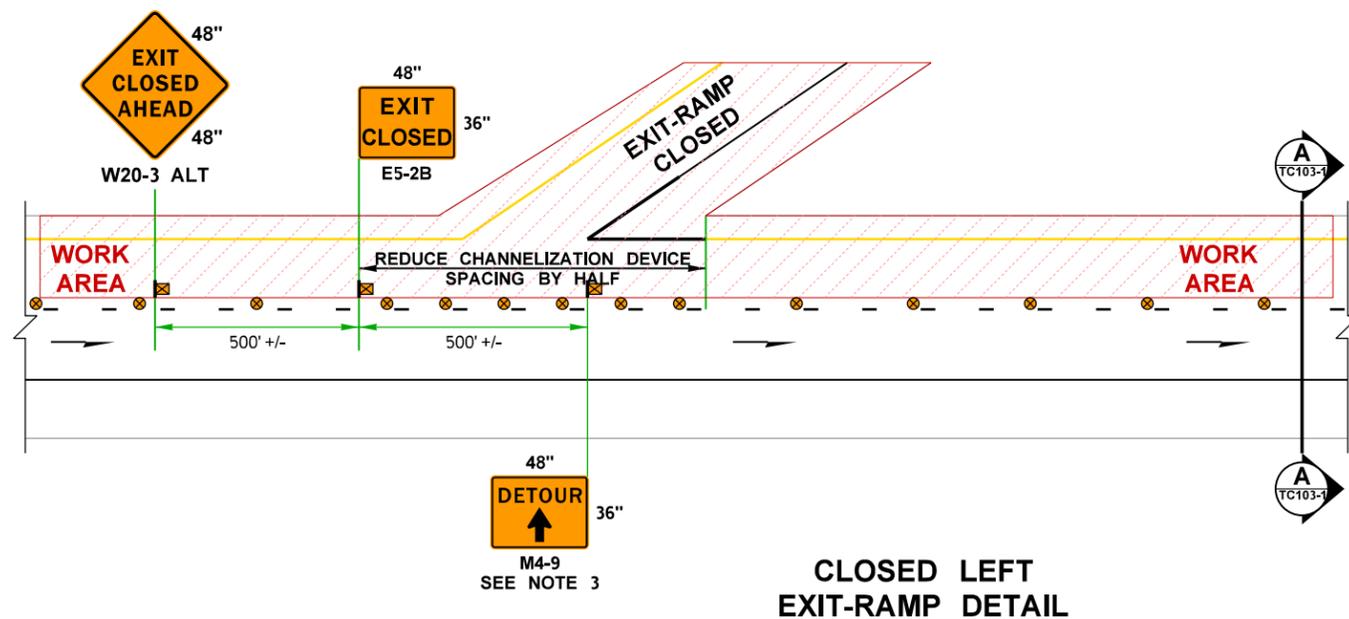
ON-RAMP SHIFT TAPER LENGTH = L/2								
RAMP SHIFT	SPEED (MPH)	45	50	55	60	65	70	75
1 Lane @ 12'	L/2 (feet)	270	320	360	360	400	440	480

MIN. ON-RAMP ACCELERATION TANGENT LENGTH = L/2								
LANE WIDTH	SPEED (MPH)	45	50	55	60	65	70	75
12 feet	L/2 (feet)	270	320	360	360	400	440	480

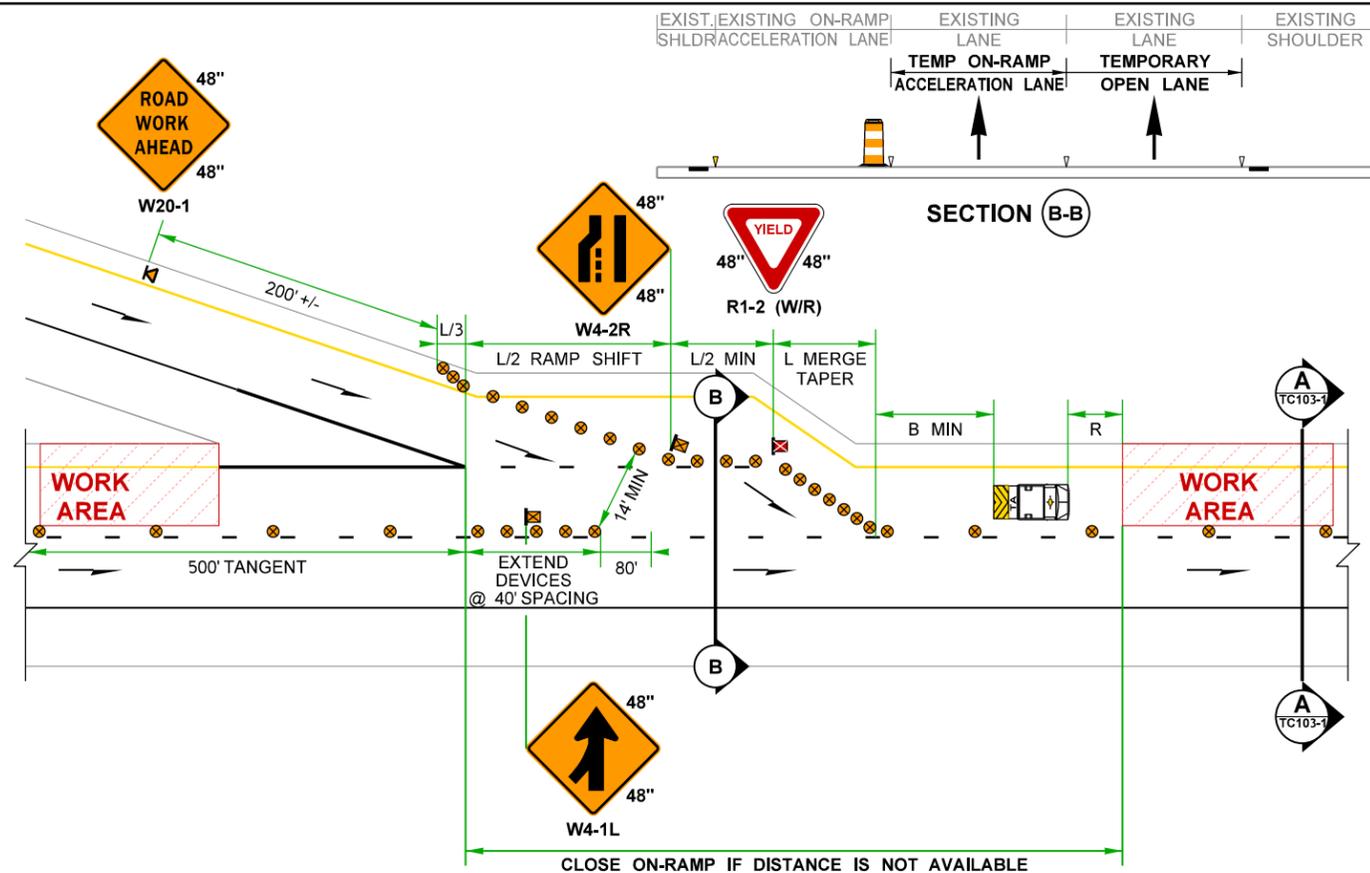
ON-RAMP MERGE TAPER LENGTH = L								
LANE WIDTH	SPEED (MPH)	45	50	55	60	65	70	75
12 feet	L (feet)	540	600	680	720	800	840	920



OPEN LEFT EXIT-RAMP DETAIL

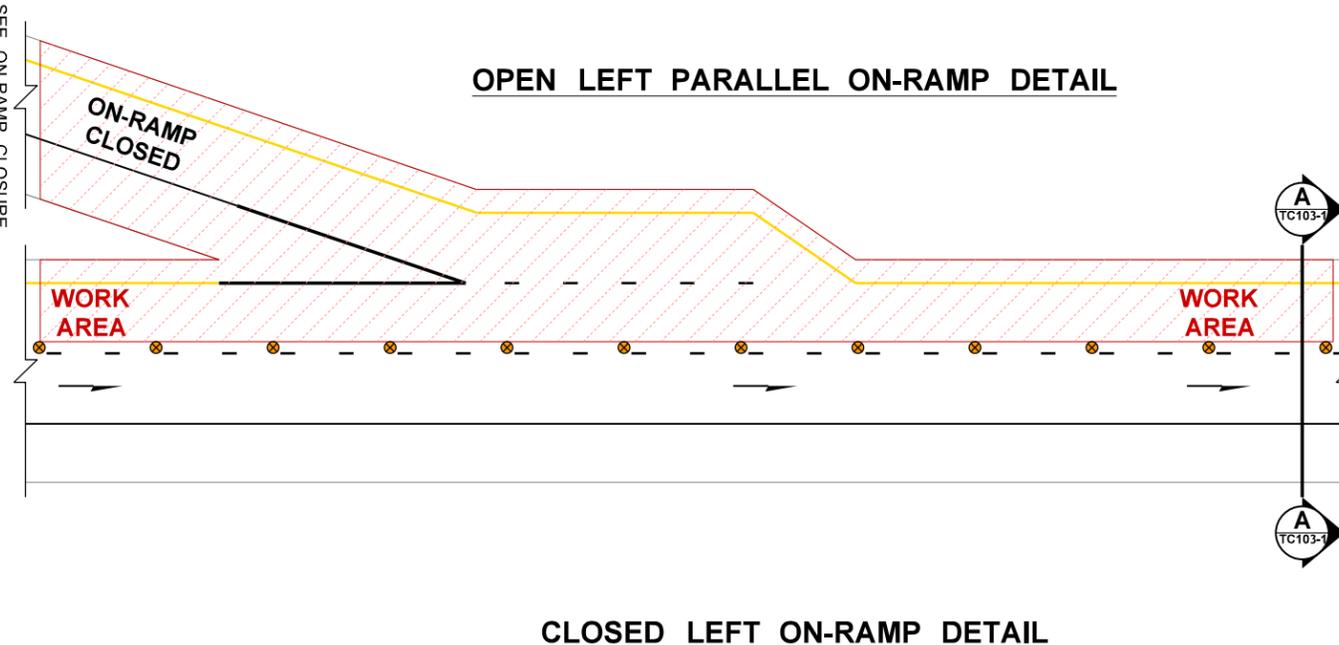


CLOSED LEFT EXIT-RAMP DETAIL



OPEN LEFT PARALLEL ON-RAMP DETAIL

SEE ON-RAMP CLOSURE TRAFFIC CONTROL PLAN



CLOSED LEFT ON-RAMP DETAIL

FREWAY (2+ LANES): SINGLE LEFT LANE CLOSURE (MAINTAIN EXISTING SPEED LIMIT)

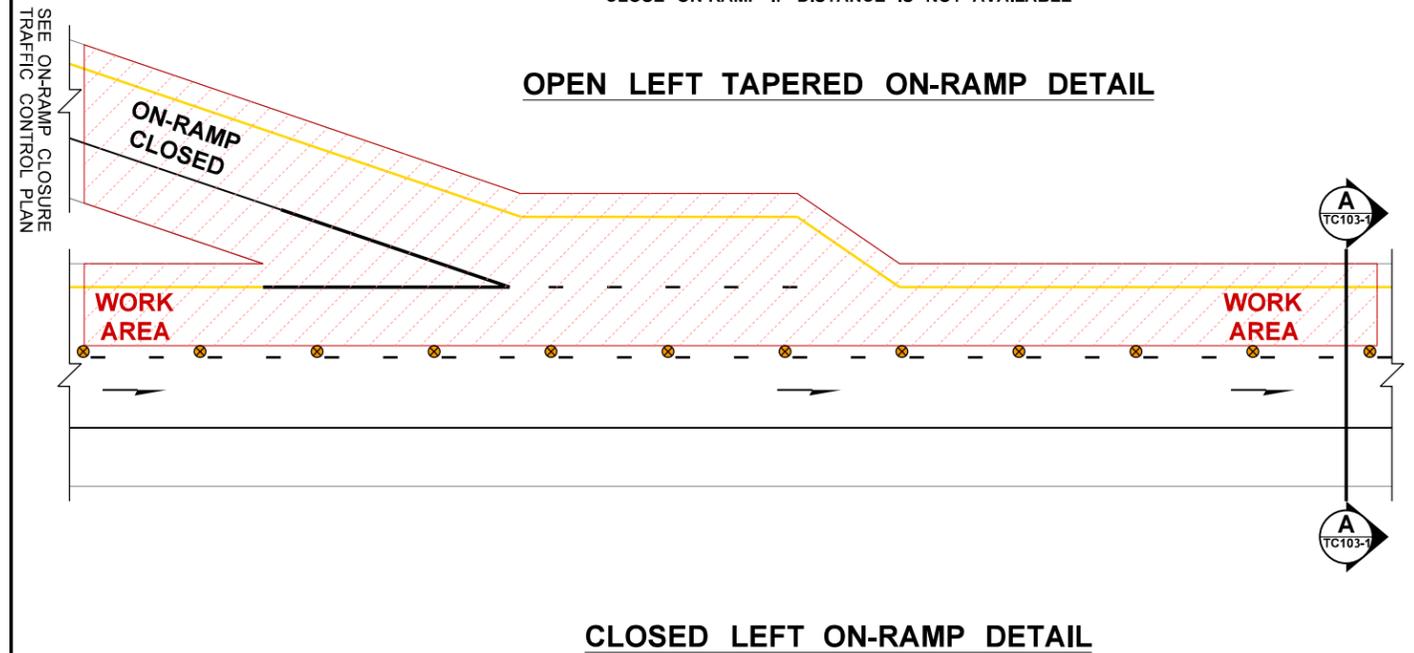
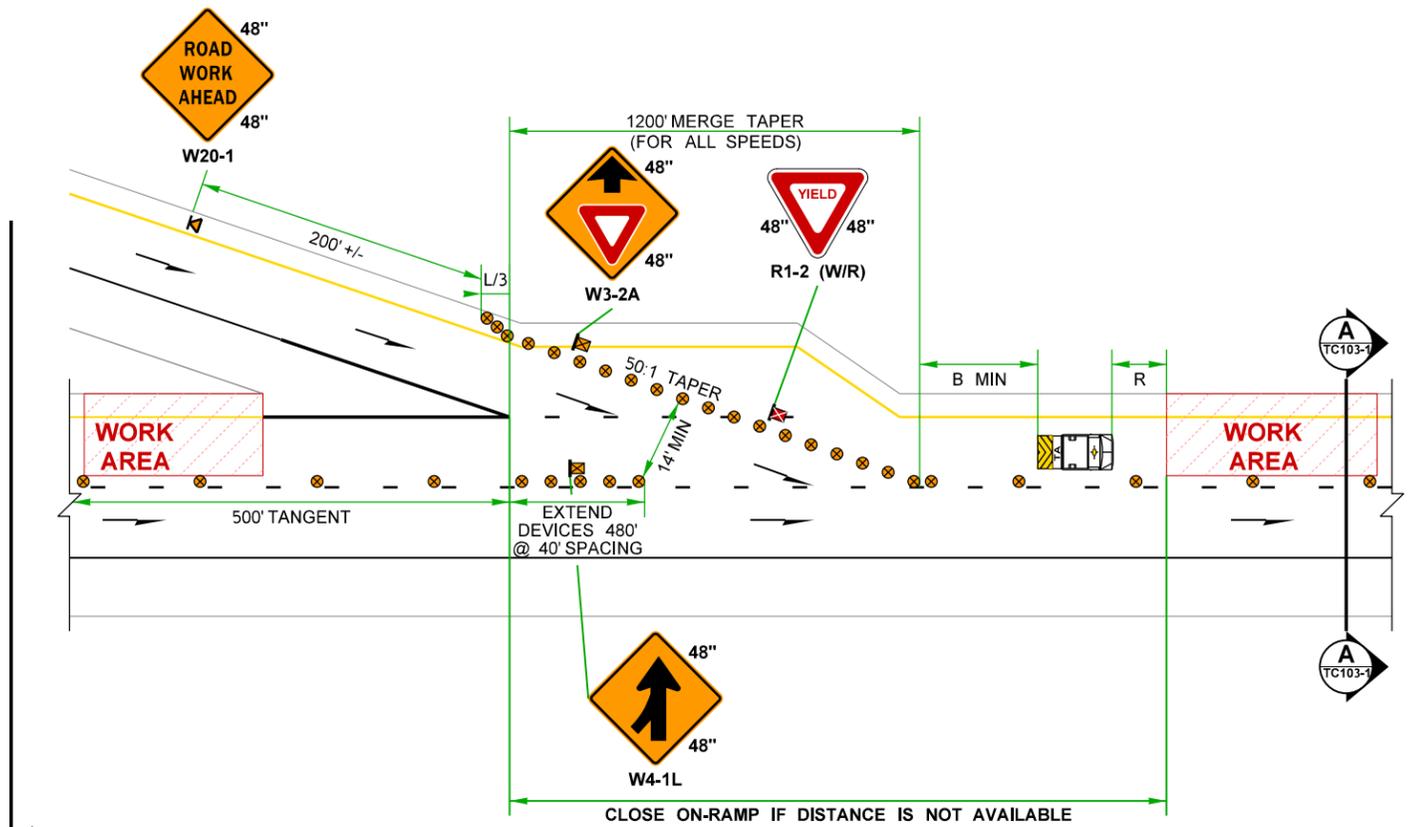
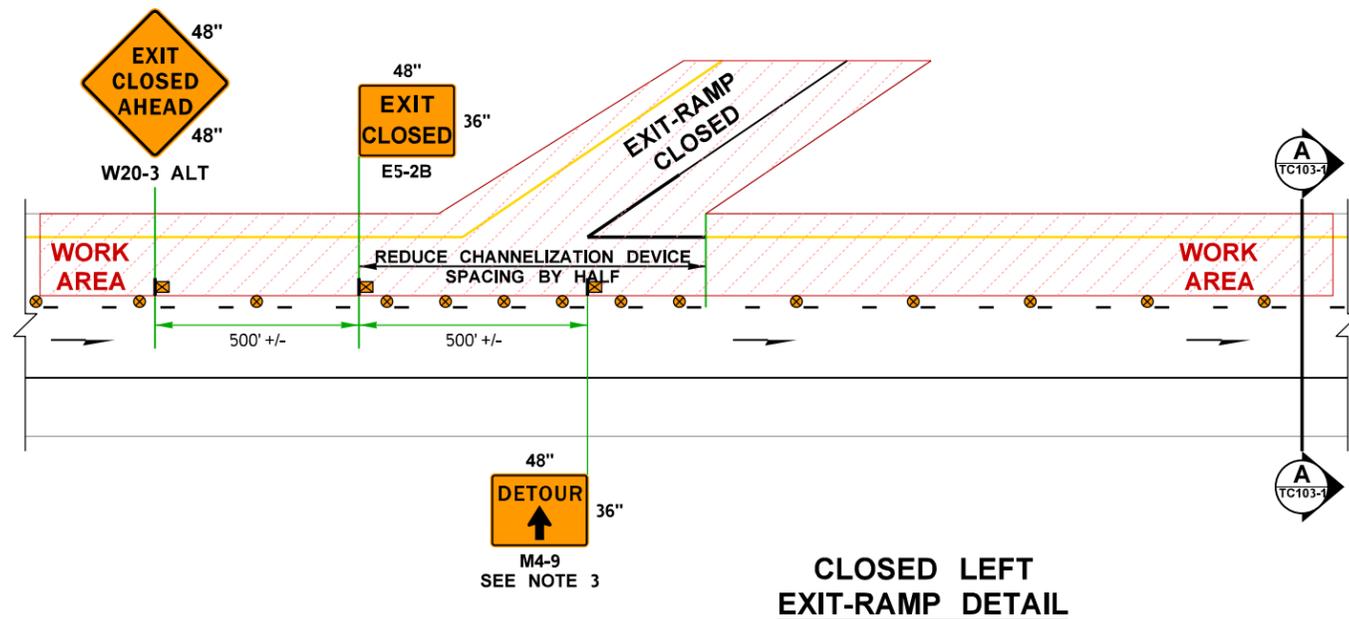
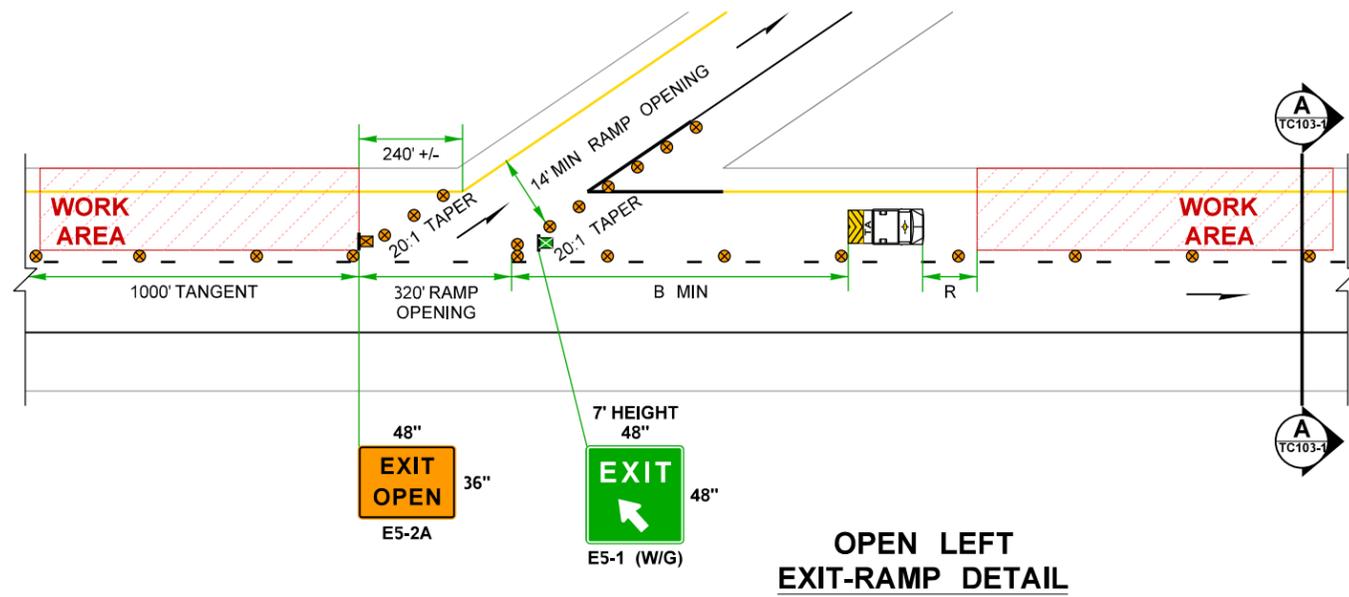
NOT TO SCALE

FILE NAME	C:\Users\LintzF\Desktop\Work Zone TCPs103Fwy1LtLane.dgn			REGION NO.	STATE	FED.AID PROJ.NO.	<p>Washington State Department of Transportation</p>	Plot 3
TIME	12:28:38 PM			10	WASH			PLAN REF NO TC103
DATE	8/10/2020			JOB NUMBER				SHEET 3A
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					

TYPICAL TRAFFIC CONTROL PLANS

NOTES:

1. FOR LEGEND, TABLES, AND ADDITIONAL NOTES: SEE TC103, SHEET 1.
2. ACTUAL NUMBER OF LANES MAY VARY.
3. SEE DETOUR PLAN FOR ADDITIONAL RAMP CLOSURE DETOUR SIGNAGE.



FREEWAY (2+ LANES): SINGLE LEFT LANE CLOSURE (MAINTAIN EXISTING SPEED LIMIT)

NOT TO SCALE

FILE NAME	C:\Users\LintzF\Desktop\Work Zone TCPs103Fwy1LtLane.dgn			REGION NO.	STATE	FED.AID PROJ.NO.	Washington State Department of Transportation	Plot 4
TIME	12:28:39 PM			10	WASH			PLAN REF NO TC103
DATE	8/10/2020			JOB NUMBER			TYPICAL TRAFFIC CONTROL PLANS	SHEET 3B OF 3 SHEETS
PLOTTED BY	LintzF			CONTRACT NO.	LOCATION NO.			
DESIGNED BY	HAAPALA & LINTZ							
ENTERED BY	F. LINTZ							
CHECKED BY	S. HAAPALA							
PROJ. ENGR.		REVISION	DATE	BY				
REGIONAL ADM.								

UPDATED WORK ZONE MICROSTATION CELLS:

IMPORTANT: An extensive library of updated cells are now available for work zone signs, detour signs (generic and route-specific), tables, legend, and symbols. Use these updated cells in all traffic control plans; at minimum, replace all work zone tables in old traffic control plans. This Typical Traffic Control Plan has updated cells already incorporated. CAE has reviewed and corrected level usage.

Color and grayscale PDFs of work zone cells are available on the WSDOT Typical Traffic Control Plans webpage (<https://www.wsdot.wa.gov/Design/Standards/PlanSheet/Work-Zone-Typical-TCPs.htm>).

WSDOT Staff:

- (1) Cell libraries are automatically updated by CAE
- (2) **Manually update or replace Microstation cells at least annually.** See <https://www.wsdot.wa.gov/Design/CAE/Technotes.htm> for technical support and guidance.

External Folks (e.g. Local Agencies):

- (1) Manually install updated WSDOT cell libraries into Microstation. See <https://www.wsdot.wa.gov/Design/CAE/Updates.htm> for download and installation instructions.
- (2) **Manually update or replace Microstation cells at least annually.** See <https://www.wsdot.wa.gov/Design/CAE/Technotes.htm> for technical support and guidance.

PRINTING IN FULL COLOR OR GRAYSCALE (BLACK/WHITE):

IMPORTANT: Black/white PDF or prints will need to be done in Grayscale; otherwise, the signs will print out as solid black and be illegible.

Setting up colored and grayscale print files in WSDOT Print Organizer:

- (1) Open Print Organizer (File -> Print Organizer)
- (2) In "Print Organizer", Add Files to Set (File -> Add File to Set...)
- (3) In "Create Print Definitions", Add Input Files (This means the Microstation file you wish to print)
- (4) In "Create Print Definitions", select the magnifying glass in Print Style Name. In "Apply Print Style", choose "PDF Color Half" to print PDFs or "Color Half" for paper prints.
- (5) Back in "Create Print Definitions", select "Manually Specified Options...". In "Print Definition Creation Options", select the "Advanced" tab, then select the Color drop-down menu, and click "True Color". Click "OK" three times to close out of the menus.
- (6) Now, the color version of the print files are added to Print Organizer.
- (7) In "Print Organizer", Add Files to Set (File -> Add File to Set...)
- (8) In "Create Print Definitions", Add Input Files. Same files again as in Step (3).
- (9) In "Create Print Definitions", select the magnifying glass in Print Style Name. In "Apply Print Style", choose "PDF Color Half" (not PDF BW Half), to print PDFs or "Color Half" (not BW Half) for paper prints.
- (10) Back in "Create Print Definitions", select "Manually Specified Options...". In "Print Definition Creation Options", select the "Advanced" tab, then select the Color drop-down menu, and click "Grayscale". Click "OK" three times to close out of the menus.
- (11) Now, the grayscale version of the print files are added to Print Organizer.

Note: In "Apply Print Style", the BW styles will not print the signs correctly, they'll print out as solid black and be illegible.

DESIGNER NOTES:

A. Contact Region Traffic Operations to determine rather Parallel (Sheet 3A) or Tapered (Sheet 3B) temporary on-ramps are their standard practice and use the corresponding sheet.

- B. These typical traffic control plans may be modified for site specific situations and/or WSDOT Region Traffic Operations standard practices.
- C. See MUTCD Table 6F-1 for additional temporary sign size information. Often work zone signs are smaller than those used permanently.
- D. WAC 468-95-300 modifies MUTCD Table 6-1 "Recommended Advance Warning Sign Minimum Spacing". Sign spacing may be adjusted for field conditions based on engineering judgement. 1500' +/- should be used on 3-sign series; however, X is acceptable for 5-sign series used for reduced work zone speed limits. A minimum of 500' +/- should be provided on freeway mainlines (see next note regarding on-ramps).
- 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 farther as needed to fit site conditions.
- F. 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 located in the temporary gore and mounted at 7' minimum.
- G. Use PCMS 1 only when work zone traffic queues are anticipated to extended behind the W20-1 sign. For additional work zone queue information, email State Work Zone Engineers at HQWORKZONE@WSDOT.WA.GOV. PCMS 2 is recommended, freeway lane closures do not require a PCMS per MUTCD 6H-33.
- H. The work zone's design is based on the posted speed limit (work zone speed limit when in effect). This includes sign spacing, tapers, channelization device spacing, buffer, and roll ahead distances. For split speed limits (SPEED LIMIT 70 TRUCKS 60) use the higher 70 mph for work zone design.
- I. Warning lights on channelization devices are optional, but may be subject to MASH-2016 crash testing requirements. Contact Region Traffic Operations for information regarding their standard practice.

- J. Channelization devices may be modified from those shown on these typical plans. Contact Region Traffic Operations for information regarding their standard practices.
- K. Vertical panel channelization devices are prohibited.
- L. Maximum channelization device spacing table is based on WAC 468-95-301 and may ALWAYS be reduced.
- M. Taper lengths assume 12-foot lanes and are rounded up based on channelization device spacing (to simplify setup). It is acceptable to use actual calculated minimum taper lengths per MUTCD Tables 6C-3 AND 6C-4. Any reduction below these MUTCD minimums should only be used as a last resort based on engineering judgement.
- N. Per MUTCD Section 6F.61, separate sequential arrow boards shall be used for each lane closure taper. Sequential arrow boards shall NOT be used for lane shifts, ramp shifts, or at on-ramp merges. P. Per MUTCD Section 6C.06, longitudinal buffer spaces are optional. Using longitudinal buffer spaces listed in MUTCD Table 6C-2 is recommended as best practice when feasible, but may be adjusted based on engineering judgement.
- O. The lateral buffer (transversely between open travel lanes and work area) is recommended as 2-foot but may be adjusted based on engineering judgement.
- P. It is WSDOT best practice to place a transportable attenuator in the closed lane adjacent to traffic just prior to the work area (with a roll ahead distance provided in between) for freeway lane closures. Following open temporary exit-ramps and open on-ramps, an additional transportable attenuator should be added prior to the next work area. In addition, either protective vehicles or transportable attenuators may be added in other closed lanes except the closed lane adjacent to traffic. Contact Region Traffic Operations for their standard practice.
- R. Placing channelization devices transversely (at 45° and 5-foot spacing) is an effective strategy to move errant drives back out of closed lanes.
- S. Per MUTCD Figure 6C-2, the reopening taper is optional. Eliminating the reopening taper allows construction vehicles (especially heavily loaded semi trucks) to accelerate straight out of the work area into the reopened lane(s) with minimal traffic impacts. This maximizes work zone capacity and safety for all.
- T. A 20:1 tapered temporary exit-ramp is typical, but 15:1 is acceptable based on engineering judgement.
- U. The on-ramp shift may occur across the paved gore at "L/2", but verify the gore's cross-slope is traversible, pavement thickness adequate, and catch basin & ITS boxes are traffic bearing types.
- V. There are two types of temporary on-ramp configurations, parallel and tapered. The parallel temporary 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 1360-13b for guidance. When using a tapered on-ramp, a single 50:1 taper (for all speeds) is used from the end of the marked gore to the end of the merge, see WSDOT Design Manual Exhibit 1360-13a for guidance.
- W. To discourage work zone intrusion, 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.
- X. Actual work area limits can be modified.
- Y. Ramp detour signage is recommended by MUTCD 6C.09. Contact Region Traffic Operations for their standard practice. It is recommended to use route specific detour signage for significant ramp closures.
- Z. This typical traffic control plan is not applicable when HOV-restricted or Express Toll Lane(s) are present. Contact Region Traffic Operations for additional guidance.
- AA. In regards to detours, contact Region Traffic Operations for their standard practices. Both generic and route-specific detour Microstation cells are now available in the work zone cell library.

FREEWAY (2+ LANES): SINGLE LEFT LANE CLOSURE (MAINTAIN EXISTING SPEED LIMIT)

NOT TO SCALE

FILE NAME	C:\Users\LintzF\Desktop\Work Zone TCPs\103Fwy1LtLane.dgn				REGION NO.	STATE	FED.AID PROJ.NO.				Plot 5
TIME	12:28:39 PM				10	WASH					PLAN REF NO
DATE	8/10/2020										TC103
PLOTTED BY	LintzF				JOB NUMBER						SHEET
DESIGNED BY	HAAPALA & LINTZ				CONTRACT NO.		LOCATION NO.				OF
ENTERED BY	F. LINTZ										SHEETS
CHECKED BY	S. HAAPALA										
PROJ. ENGR.											
REGIONAL ADM.		REVISION	DATE	BY							DESIGNER NOTES



DESIGNER NOTES

PCMS 1	
1	2
SLOW OR STOPPED TRAFFIC	NEXT # MILES
2.0 SEC	2.0 SEC

PCMS MAY BE TRUCK-MOUNTED. (10" LETTERS OK) (3 DRUMS OPTIONAL)

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= APPROXIMATE QUEUE LENGTH ROUNDED UP TO NEAREST MILE

PCMS	
1	2
LEFT LANE CLOSED	1.5 MILES AHEAD
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LOCATE PCMS PER WSDOT STANDARD SPEC. 1-10.3(3)C.

MAXIMUM CHANNELIZATION DEVICE SPACING (feet)		
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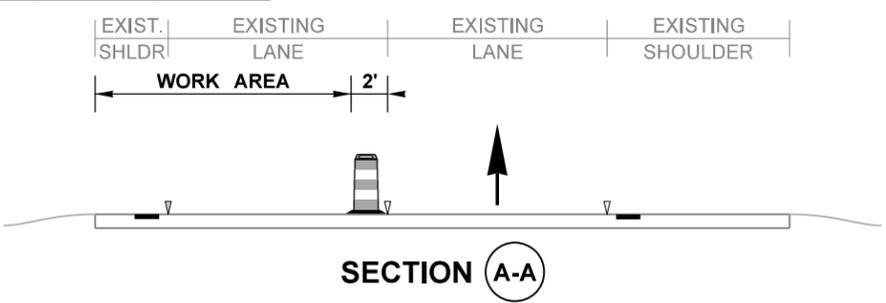
SIGN SPACING = X (1)		
FREEWAYS & EXPRESSWAYS	50-75 MPH	1500' +/-
(1) ALL SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERCHANGE RAMP.		

SHOULDER CLOSURE TAPER LENGTH = L/3								
SHOULDER WIDTH	SPEED (MPH)	45	50	55	60	65	70	75
6'	L/3 (feet)	90	120	120	120	160	160	160
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FOR SHOULDERS LESS THAN 6', USE 3 DEVICES MINIMUM

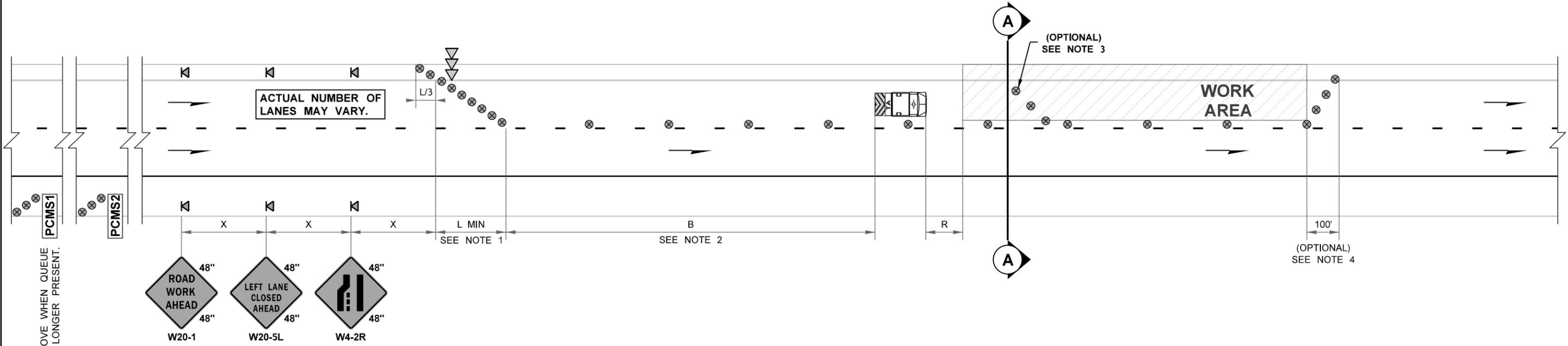
LONGITUDINAL BUFFER SPACE = B							
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B (feet)	360	425	495	570	645	730	820

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HOST VEHICLE WEIGHT 9,900 TO 22,000 lbs.	HOST VEHICLE WEIGHT 22,001+ lbs.		
45-55 MPH	60+ MPH	45-55 MPH	60+ MPH
123'	172'	100'	150'



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FOR RAMP DETAILS: SEE TC103, SHEET 2 AND 3.



NOTES:

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- IF USED, PLACE DEVICES TRANSVERSELY ACROSS CLOSED LANES AT 45° +/- AND 5' SPACING AT STRATEGIC LOCATIONS.
- IF USED, REOPENING TAPER DEVICE SPACING IS 20'.
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- PLAN IS APPLICABLE TO LANE CLOSURES OF 3 DAYS OR LESS.
- BICYCLES PROHIBITED THROUGH WORK ZONE; CONSIDER PROVIDING DETOUR, ALTERNATIVE ROUTE, OR SHUTTLE IN HIGH-USE LOCATIONS PERMITTING PERMANENT BICYCLE ACCESS.

LEGEND:

- TEMPORARY SIGN LOCATION
- TEMPORARY SIGN LOCATION (5' MIN HEIGHT)
- TRAFFIC SAFETY DRUM
- SEQUENTIAL ARROW SIGN
- TRANSPORTABLE ATTENUATOR
- PCMS PORTABLE CHANGEABLE MESSAGE SIGN

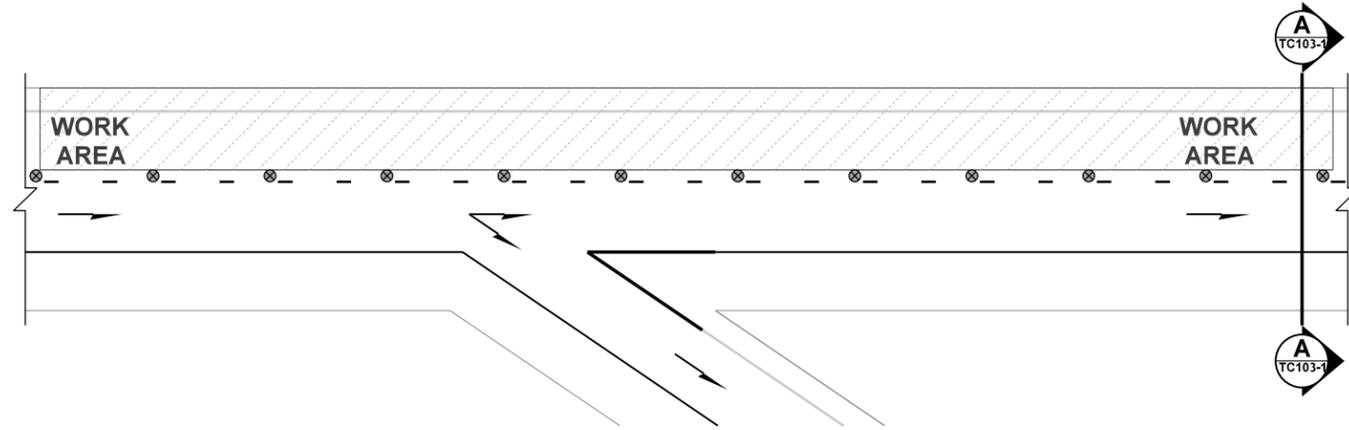
FREEWAY (2+ LANES): SINGLE LEFT LANE CLOSURE (MAINTAIN EXISTING SPEED LIMIT)

NOT TO SCALE

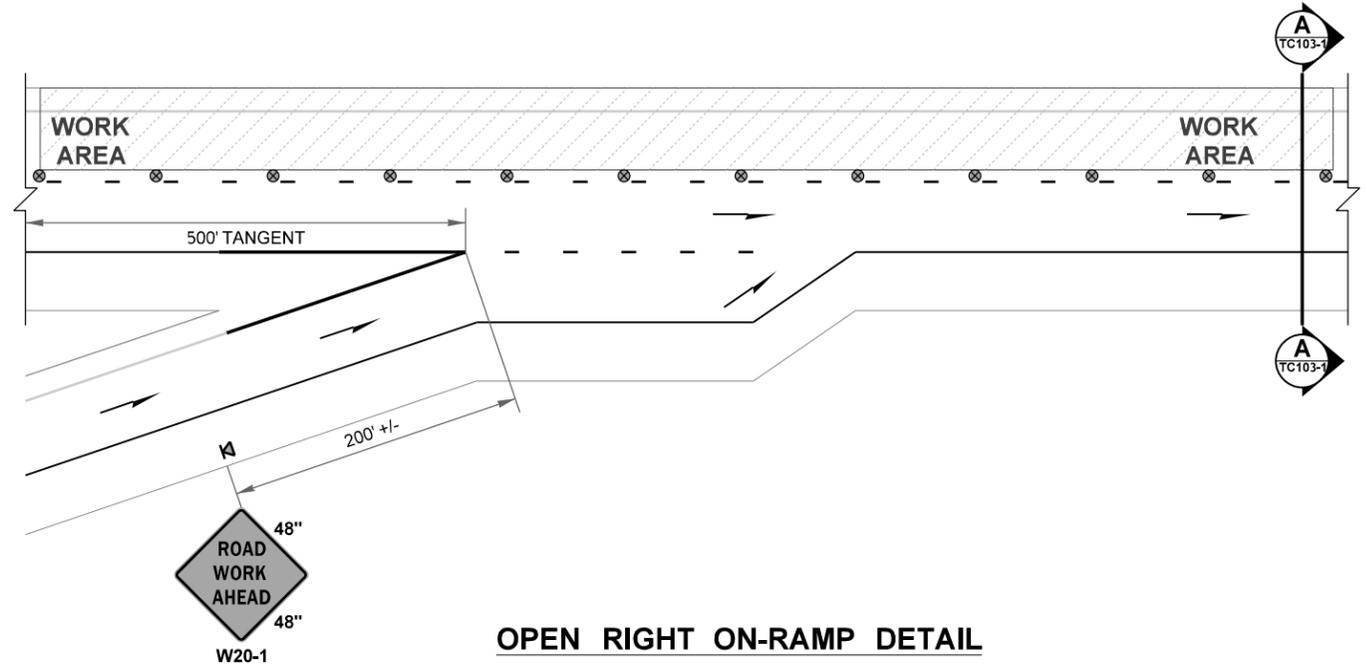
FILE NAME	C:\Users\Lintz\Desktop\Work Zone TCPs\103Fwy1LtLane.dgn	REGION NO.	STATE	FED.AID PROJ.NO.	Washington State Department of Transportation	Plot 1 PLAN REF NO TC103
TIME	12:28:40 PM	10	WASH			
DATE	8/10/2020	JOB NUMBER			SHEET 1 OF 3 SHEETS	
PLOTTED BY	LintzF	CONTRACT NO.				
DESIGNED BY	HAAPALA & LINTZ	LOCATION NO.			TYPICAL TRAFFIC CONTROL PLANS	
ENTERED BY	F. LINTZ					
CHECKED BY	S. HAAPALA					
PROJ. ENGR.						
REGIONAL ADM.		REVISION	DATE	BY		

NOTES:

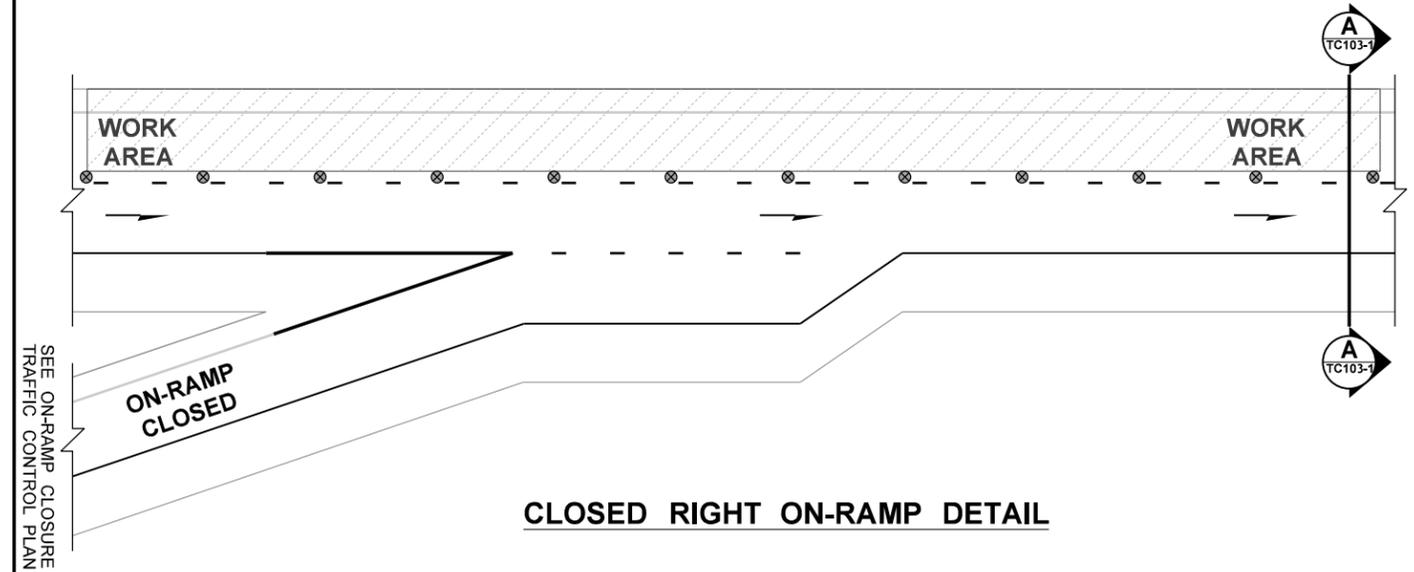
1. FOR LEGEND, TABLES, AND ADDITIONAL NOTES: SEE TC103, SHEET 1.
2. ACTUAL NUMBER OF LANES MAY VARY.



OPEN RIGHT EXIT-RAMP DETAIL



OPEN RIGHT ON-RAMP DETAIL



CLOSED RIGHT EXIT-RAMP DETAIL

RIGHT EXIT-RAMPS ARE TO REMAIN OPEN

CLOSED RIGHT ON-RAMP DETAIL

FREEWAY (2+ LANES): SINGLE LEFT LANE CLOSURE (MAINTAIN EXISTING SPEED LIMIT)

NOT TO SCALE

FILE NAME	C:\Users\Lintz\F\Desktop\Work Zone TCPs\103Fwy1LtLane.dgn				REGION NO.	STATE	FED.AID PROJ.NO.	Washington State Department of Transportation	Plot 2
TIME	12:28:41 PM				10	WASH			PLAN REF NO TC103
DATE	8/10/2020				JOB NUMBER				SHEET 2 OF 3 SHEETS
PLOTTED BY	LintzF				CONTRACT NO.	LOCATION NO.			
DESIGNED BY	HAAPALA & LINTZ								
ENTERED BY	F. LINTZ								
CHECKED BY	S. HAAPALA								
PROJ. ENGR.									
REGIONAL ADM.		REVISION	DATE	BY					

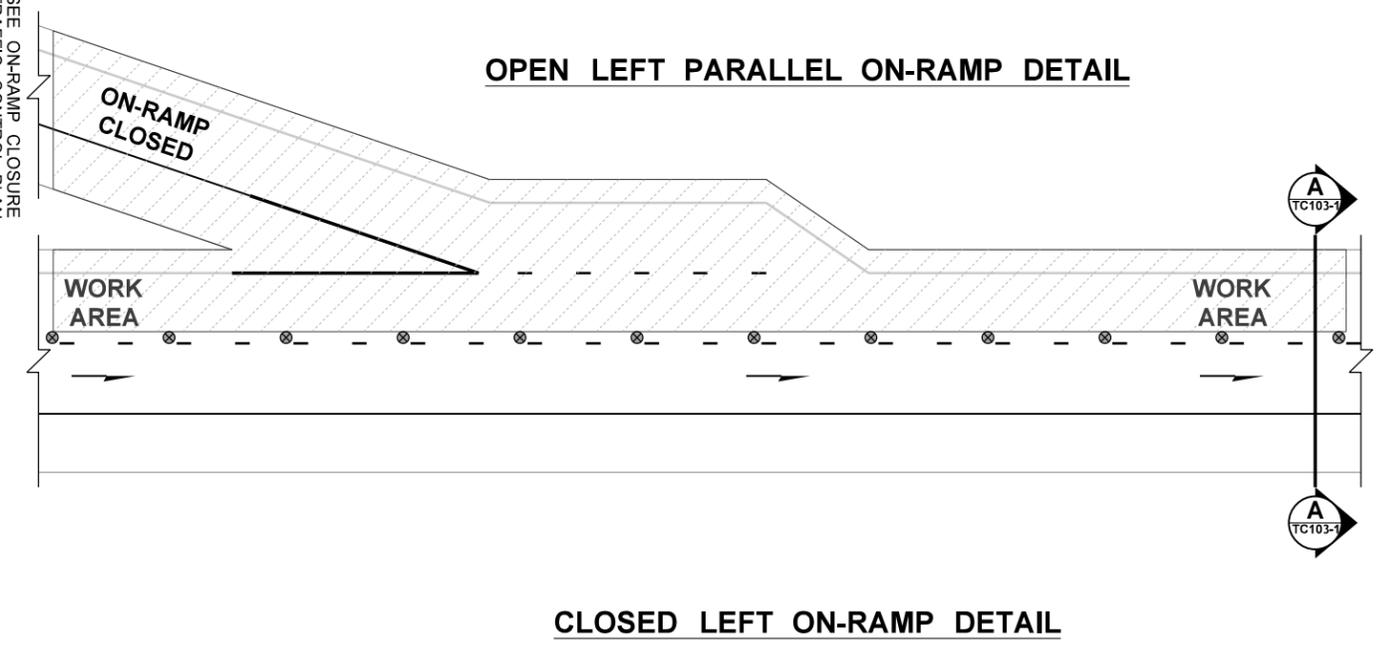
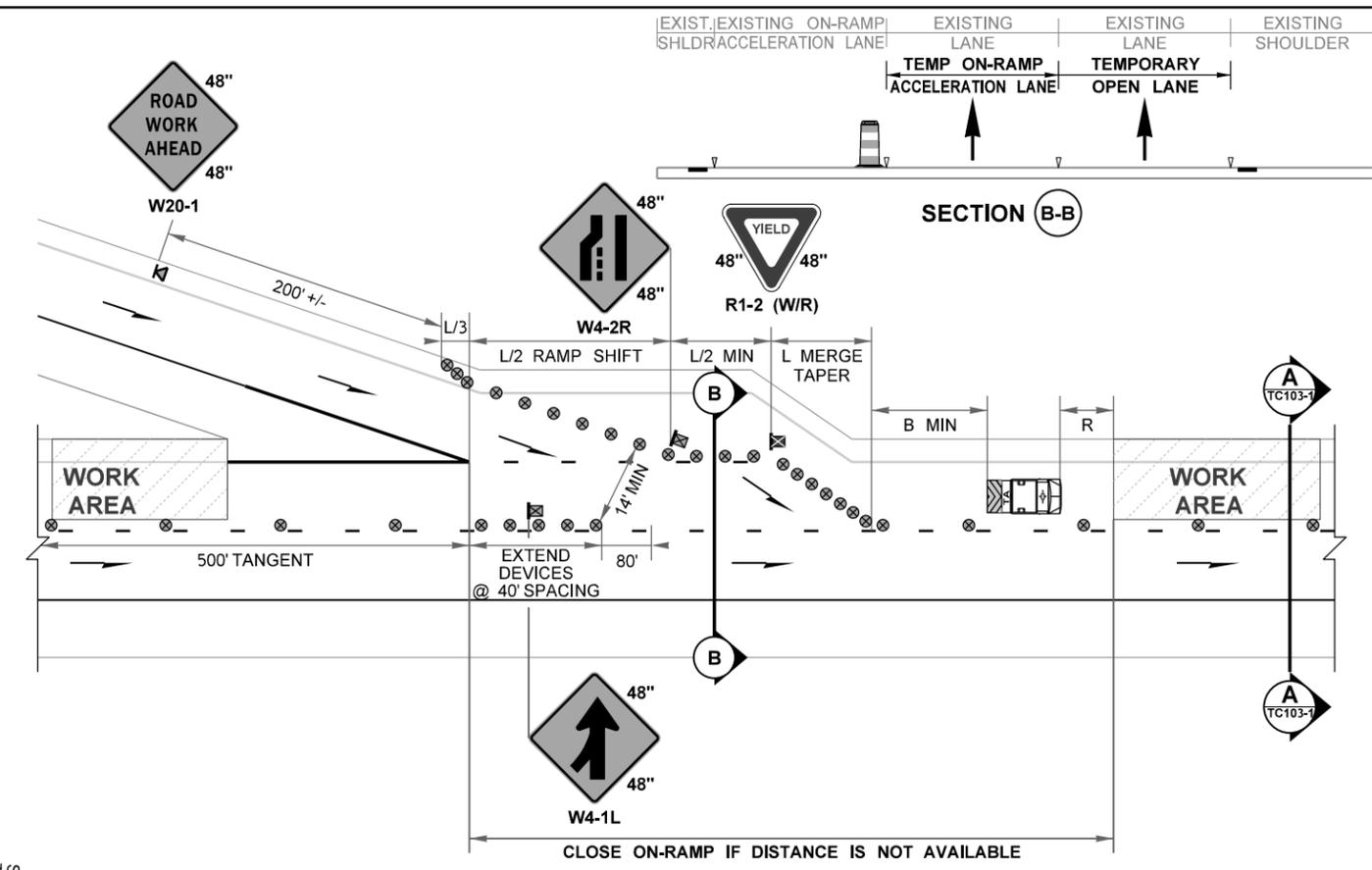
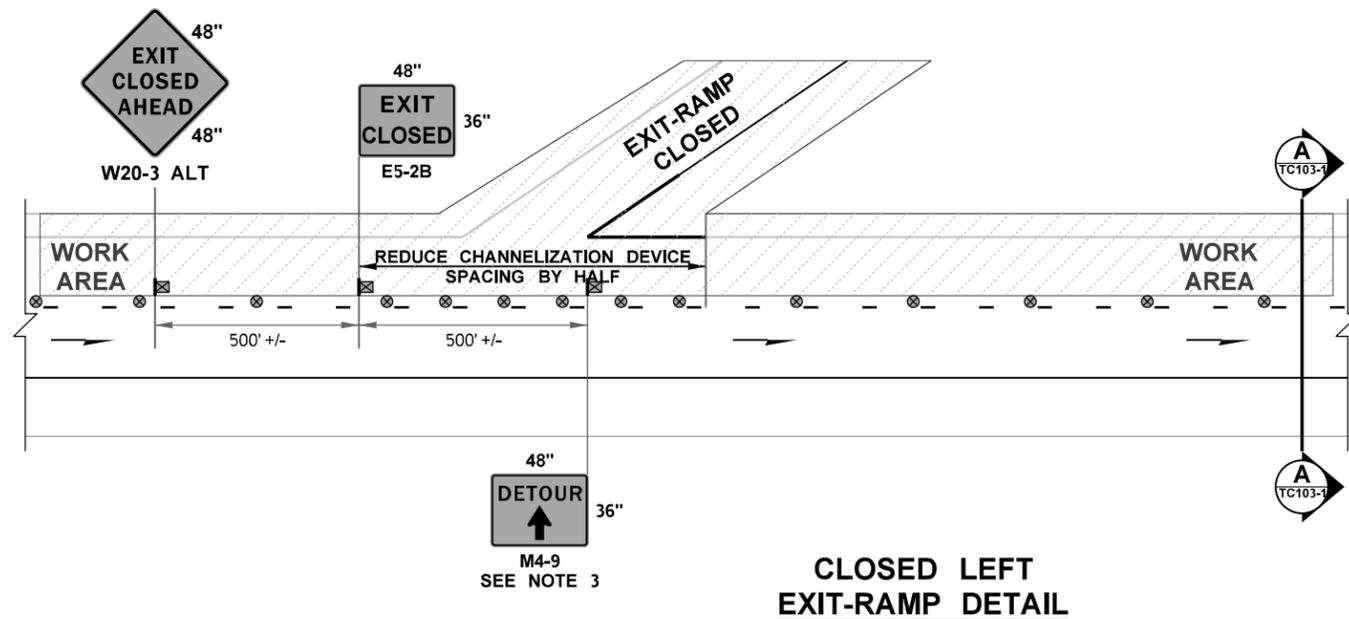
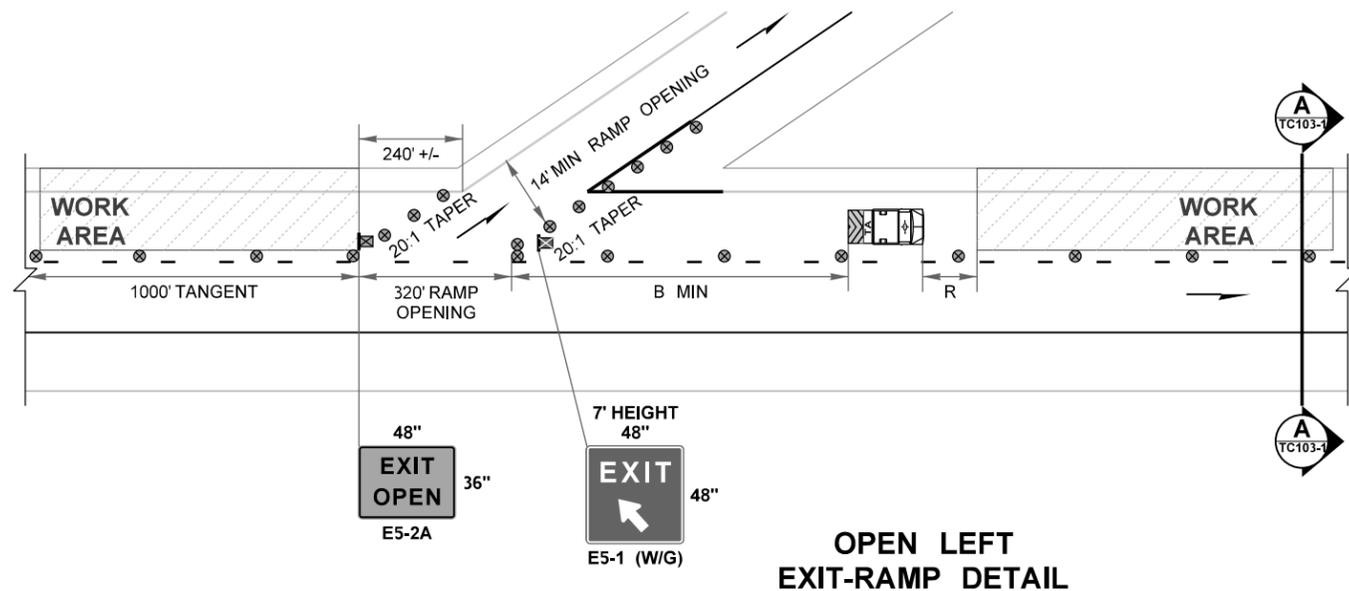
NOTES:

1. FOR LEGEND, TABLES, AND ADDITIONAL NOTES: SEE TC103, SHEET 1.
2. ACTUAL NUMBER OF LANES MAY VARY.
3. SEE DETOUR PLAN FOR ADDITIONAL RAMP CLOSURE DETOUR SIGNAGE.

ON-RAMP SHIFT TAPER LENGTH = L/2								
RAMP SHIFT	SPEED (MPH)	45	50	55	60	65	70	75
1 Lane @ 12'	L/2 (feet)	270	320	360	360	400	440	480

MIN. ON-RAMP ACCELERATION TANGENT LENGTH = L/2								
LANE WIDTH	SPEED (MPH)	45	50	55	60	65	70	75
12 feet	L/2 (feet)	270	320	360	360	400	440	480

ON-RAMP MERGE TAPER LENGTH = L								
LANE WIDTH	SPEED (MPH)	45	50	55	60	65	70	75
12 feet	L (feet)	540	600	680	720	800	840	920



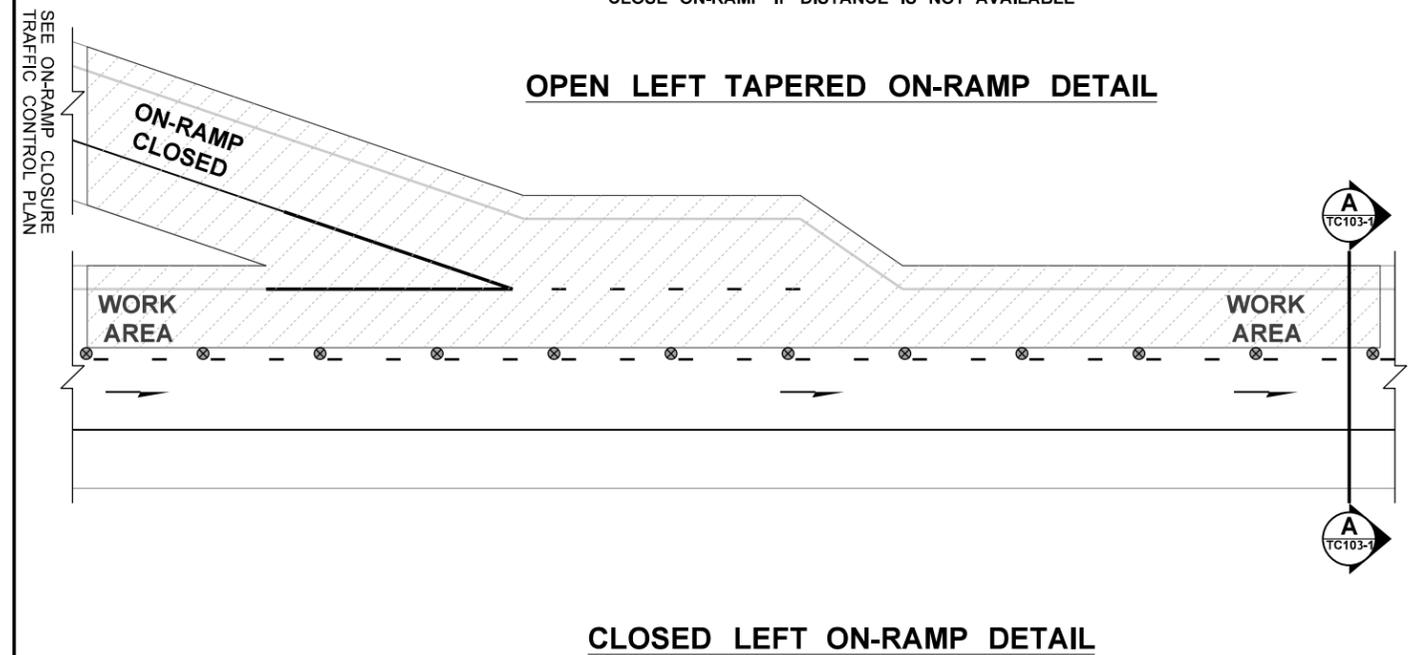
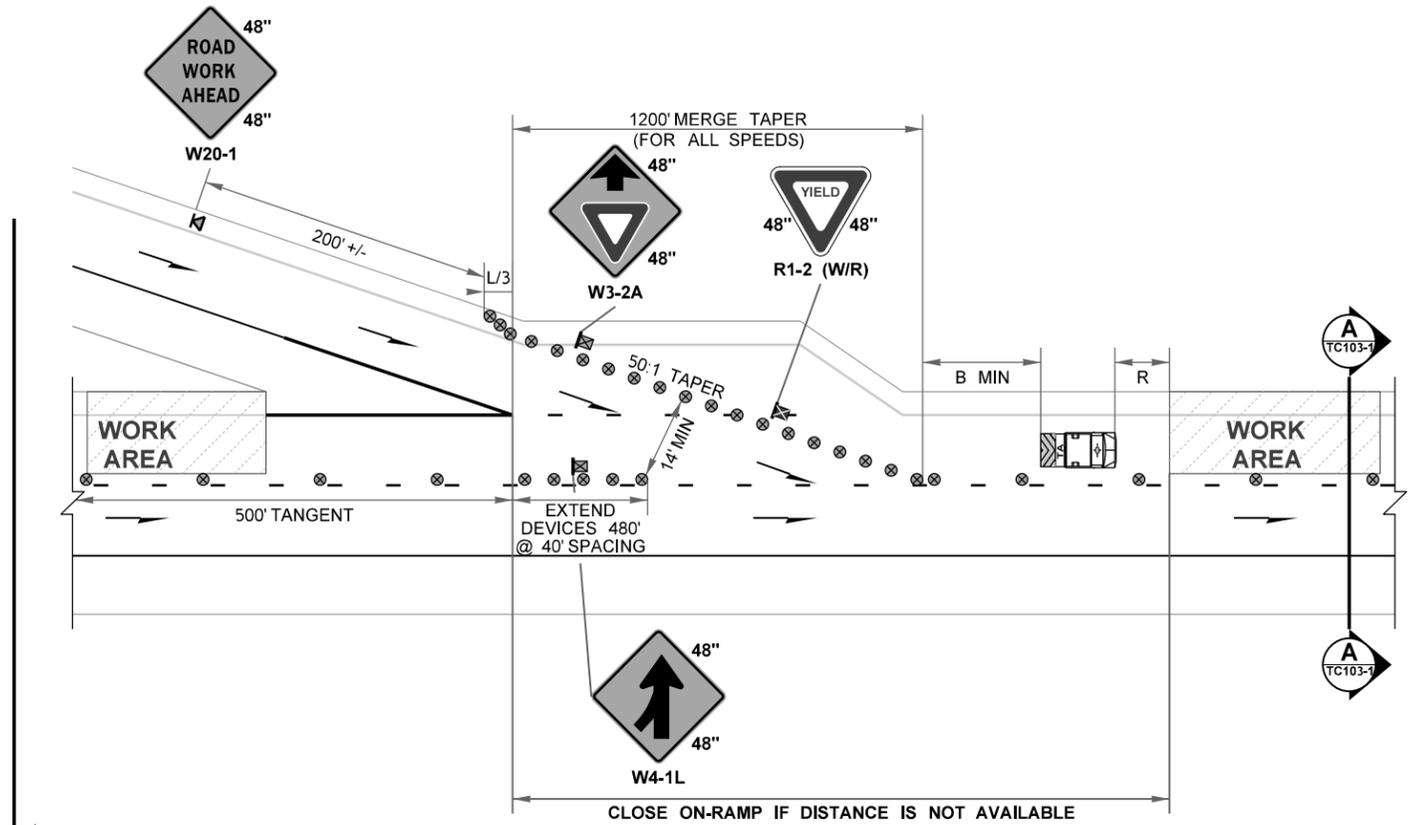
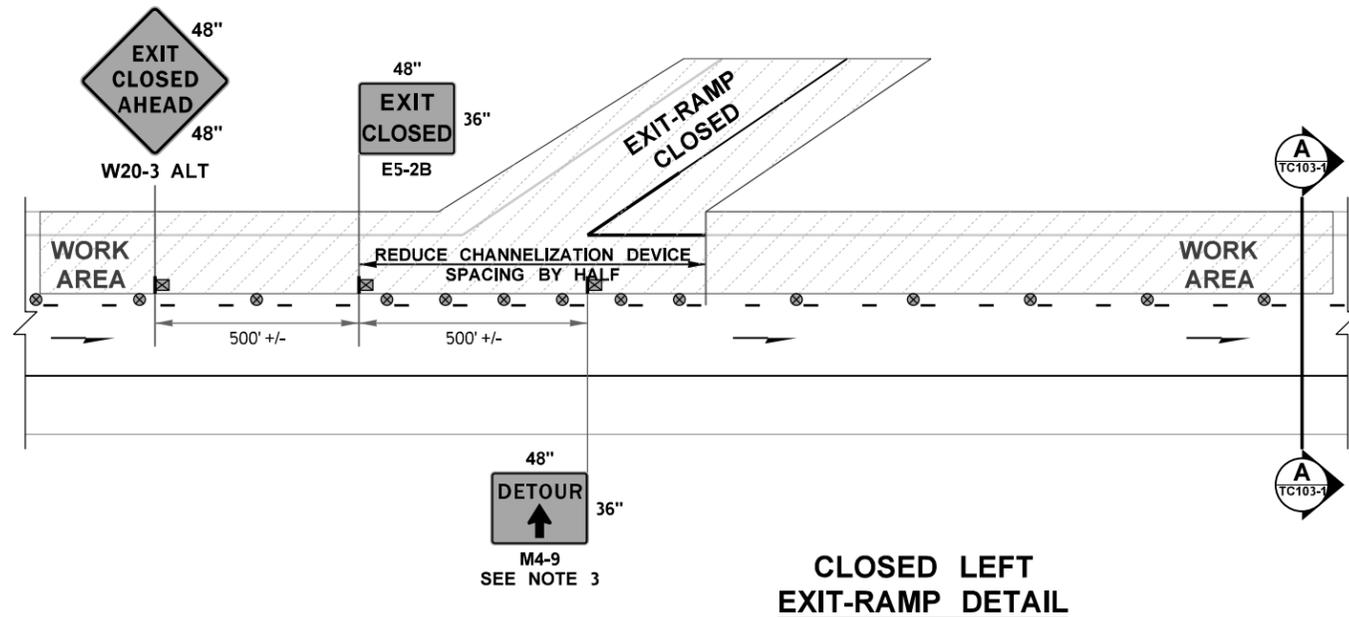
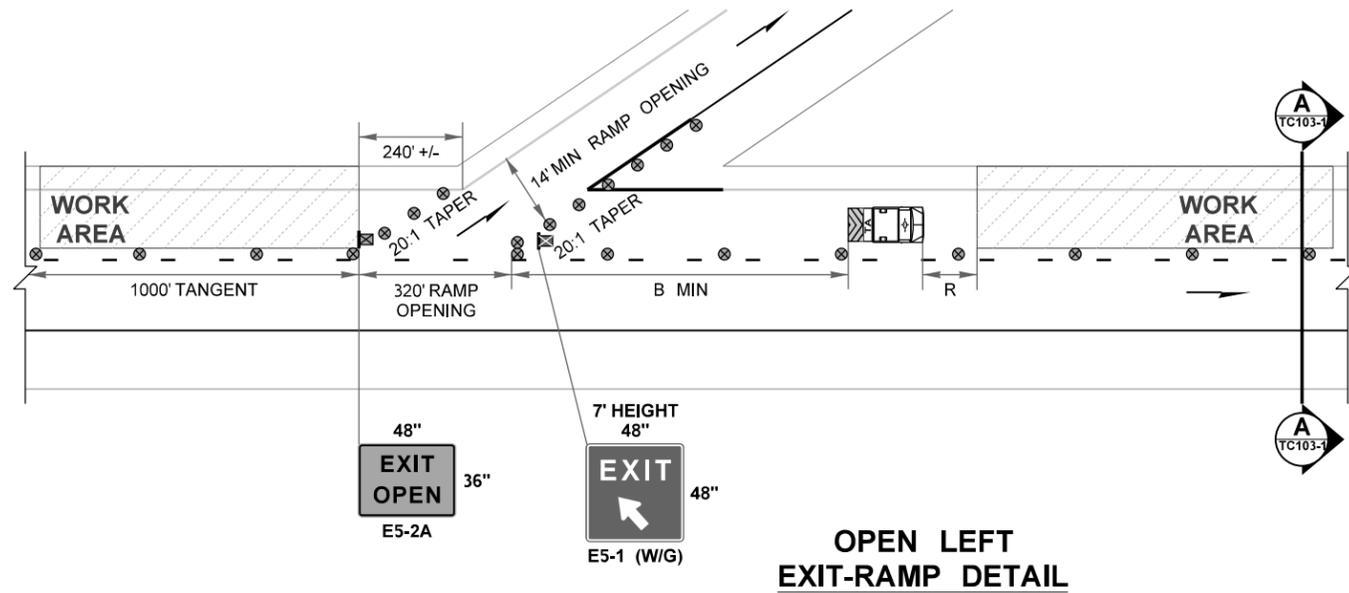
FREEWAY (2+ LANES): SINGLE LEFT LANE CLOSURE (MAINTAIN EXISTING SPEED LIMIT)

NOT TO SCALE

FILE NAME	C:\Users\Lintz\F\Desktop\Work Zone TCPs103Fwy1LtLane.dgn			REGION NO.	STATE	FED.AID PROJ.NO.	Washington State Department of Transportation	Plot 3
TIME	12:28:41 PM			10	WASH			PLAN REF NO TC103
DATE	8/10/2020			JOB NUMBER				SHEET 3A
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	P.E. STAMP BOX	DATE	P.E. STAMP BOX	TYPICAL TRAFFIC CONTROL PLANS	

NOTES:

1. FOR LEGEND, TABLES, AND ADDITIONAL NOTES: SEE TC103, SHEET 1.
2. ACTUAL NUMBER OF LANES MAY VARY.
3. SEE DETOUR PLAN FOR ADDITIONAL RAMP CLOSURE DETOUR SIGNAGE.



FREWAY (2+ LANES): SINGLE LEFT LANE CLOSURE (MAINTAIN EXISTING SPEED LIMIT)

NOT TO SCALE

FILE NAME	C:\Users\LintzF\Desktop\Work Zone TCPs103Fwy1LtLane.dgn			REGION NO.	STATE	FED.AID PROJ.NO.	<p>Washington State Department of Transportation</p>	Plot 4
TIME	12:28:42 PM			10	WASH			PLAN REF NO TC103
DATE	8/10/2020			JOB NUMBER			<p>TYPICAL TRAFFIC CONTROL PLANS</p>	SHEET 3B OF 3 SHEETS
PLOTTED BY	LintzF			CONTRACT NO.	LOCATION NO.			
DESIGNED BY	HAAPALA & LINTZ							
ENTERED BY	F. LINTZ							
CHECKED BY	S. HAAPALA							
PROJ. ENGR.								
REGIONAL ADM.	REVISION	DATE	BY					

UPDATED WORK ZONE MICROSTATION CELLS:

IMPORTANT: An extensive library of updated cells are now available for work zone signs, detour signs (generic and route-specific), tables, legend, and symbols. Use these updated cells in all traffic control plans; at minimum, replace all work zone tables in old traffic control plans. This Typical Traffic Control Plan has updated cells already incorporated. CAE has reviewed and corrected level usage.

Color and grayscale PDFs of work zone cells are available on the WSDOT Typical Traffic Control Plans webpage (<https://www.wsdot.wa.gov/Design/Standards/PlanSheet/Work-Zone-Typical-TCPs.htm>).

WSDOT Staff:

- (1) Cell libraries are automatically updated by CAE
- (2) **Manually update or replace Microstation cells at least annually.** See <https://www.wsdot.wa.gov/Design/CAE/Technotes.htm> for technical support and guidance.

External Folks (e.g. Local Agencies):

- (1) Manually install updated WSDOT cell libraries into Microstation. See <https://www.wsdot.wa.gov/Design/CAE/Updates.htm> for download and installation instructions.
- (2) **Manually update or replace Microstation cells at least annually.** See <https://www.wsdot.wa.gov/Design/CAE/Technotes.htm> for technical support and guidance.

PRINTING IN FULL COLOR OR GRAYSCALE (BLACK/WHITE):

IMPORTANT: Black/white PDF or prints will need to be done in Grayscale; otherwise, the signs will print out as solid black and be illegible.

Setting up colored and grayscale print files in WSDOT Print Organizer:

- (1) Open Print Organizer (File -> Print Organizer)
- (2) In "Print Organizer", Add Files to Set (File -> Add File to Set...)
- (3) In "Create Print Definitions", Add Input Files (This means the Microstation file you wish to print)
- (4) In "Create Print Definitions", select the magnifying glass in Print Style Name. In "Apply Print Style", choose "PDF Color Half" to print PDFs or "Color Half" for paper prints.
- (5) Back in "Create Print Definitions", select "Manually Specified Options...". In "Print Definition Creation Options", select the "Advanced" tab, then select the Color drop-down menu, and click "True Color". Click "OK" three times to close out of the menus.
- (6) Now, the color version of the print files are added to Print Organizer.
- (7) In "Print Organizer", Add Files to Set (File -> Add File to Set...)
- (8) In "Create Print Definitions", Add Input Files. Same files again as in Step (3).
- (9) In "Create Print Definitions", select the magnifying glass in Print Style Name. In "Apply Print Style", choose "PDF Color Half" (not PDF BW Half), to print PDFs or "Color Half" (not BW Half) for paper prints.
- (10) Back in "Create Print Definitions", select "Manually Specified Options...". In "Print Definition Creation Options", select the "Advanced" tab, then select the Color drop-down menu, and click "Grayscale". Click "OK" three times to close out of the menus.
- (11) Now, the grayscale version of the print files are added to Print Organizer.

Note: In "Apply Print Style", the BW styles will not print the signs correctly, they'll print out as solid black and be illegible.

DESIGNER NOTES:

- A. Contact Region Traffic Operations to determine rather Parallel (Sheet 3A) or Tapered (Sheet 3B) temporary on-ramps are their standard practice and use the corresponding sheet.
- B. These typical traffic control plans may be modified for site specific situations and/or WSDOT Region Traffic Operations standard practices.
- C. See MUTCD Table 6F-1 for additional temporary sign size information. Often work zone signs are smaller than those used permanently.
- D. WAC 468-95-300 modifies MUTCD Table 6-1 "Recommended Advance Warning Sign Minimum Spacing". Sign spacing may be adjusted for field conditions based on engineering judgement. 1500' +/- should be used on 3-sign series; however, X is acceptable for 5-sign series used for reduced work zone speed limits. A minimum of 500' +/- should be provided on freeway mainlines (see next note regarding on-ramps).
- 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 farther as needed to fit site conditions.
- F. 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 located in the temporary gore and mounted at 7' minimum.
- G. Use PCMS 1 only when work zone traffic queues are anticipated to extended behind the W20-1 sign. For additional work zone queue information, email State Work Zone Engineers at HQWORKZONE@WSDOT.WA.GOV. PCMS 2 is recommended, freeway lane closures do not require a PCMS per MUTCD 6H-33.
- H. The work zone's design is based on the posted speed limit (work zone speed limit when in effect). This includes sign spacing, tapers, channelization device spacing, buffer, and roll ahead distances. For split speed limits (SPEED LIMIT 70 TRUCKS 60) use the higher 70 mph for work zone design.
- I. Warning lights on channelization devices are optional, but may be subject to MASH-2016 crash testing requirements. Contact Region Traffic Operations for information regarding their standard practice.

- J. Channelization devices may be modified from those shown on these typical plans. Contact Region Traffic Operations for information regarding their standard practices.
- K. Vertical panel channelization devices are prohibited.
- L. Maximum channelization device spacing table is based on WAC 468-95-301 and may ALWAYS be reduced.
- M. Taper lengths assume 12-foot lanes and are rounded up based on channelization device spacing (to simplify setup). It is acceptable to use actual calculated minimum taper lengths per MUTCD Tables 6C-3 AND 6C-4. Any reduction below these MUTCD minimums should only be used as a last resort based on engineering judgement.
- N. Per MUTCD Section 6F.61, separate sequential arrow boards shall be used for each lane closure taper. Sequential arrow boards shall NOT be used for lane shifts, ramp shifts, or at on-ramp merges. P. Per MUTCD Section 6C.06, longitudinal buffer spaces are optional. Using longitudinal buffer spaces listed in MUTCD Table 6C-2 is recommended as best practice when feasible, but may be adjusted based on engineering judgement.
- O. The lateral buffer (transversely between open travel lanes and work area) is recommended as 2-foot but may be adjusted based on engineering judgement.
- P. It is WSDOT best practice to place a transportable attenuator in the closed lane adjacent to traffic just prior to the work area (with a roll ahead distance provided in between) for freeway lane closures. Following open temporary exit-ramps and open on-ramps, an additional transportable attenuator should be added prior to the next work area. In addition, either protective vehicles or transportable attenuators may be added in other closed lanes except the closed lane adjacent to traffic. Contact Region Traffic Operations for their standard practice.
- R. Placing channelization devices transversely (at 45° and 5-foot spacing) is an effective strategy to move errant drives back out of closed lanes.
- S. Per MUTCD Figure 6C-2, the reopening taper is optional. Eliminating the reopening taper allows construction vehicles (especially heavily loaded semi trucks) to accelerate straight out of the work area into the reopened lane(s) with minimal traffic impacts. This maximizes work zone capacity and safety for all.
- T. A 20:1 tapered temporary exit-ramp is typical, but 15:1 is acceptable based on engineering judgement.
- U. The on-ramp shift may occur across the paved gore at "L/2", but verify the gore's cross-slope is traversible, pavement thickness adequate, and catch basin & ITS boxes are traffic bearing types.
- V. There are two types of temporary on-ramp configurations, parallel and tapered. The parallel temporary 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 1360-13b for guidance. When using a tapered on-ramp, a single 50:1 taper (for all speeds) is used from the end of the marked gore to the end of the merge, see WSDOT Design Manual Exhibit 1360-13a for guidance.
- W. To discourage work zone intrusion, 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.
- X. Actual work area limits can be modified.
- Y. Ramp detour signage is recommended by MUTCD 6C.09. Contact Region Traffic Operations for their standard practice. It is recommended to use route specific detour signage for significant ramp closures.
- Z. This typical traffic control plan is not applicable when HOV-restricted or Express Toll Lane(s) are present. Contact Region Traffic Operations for additional guidance.
- AA. In regards to detours, contact Region Traffic Operations for their standard practices. Both generic and route-specific detour Microstation cells are now available in the work zone cell library.

FREEWAY (2+ LANES): SINGLE LEFT LANE CLOSURE (MAINTAIN EXISTING SPEED LIMIT)

NOT TO SCALE

FILE NAME	C:\Users\LintzF\Desktop\Work Zone TCPs\103Fwy1LtLane.dgn				REGION NO.	STATE	FED.AID PROJ.NO.				Plot 5
TIME	12:28:42 PM				10	WASH					PLAN REF NO
DATE	8/10/2020										TC103
PLOTTED BY	LintzF				JOB NUMBER						SHEET
DESIGNED BY	HAAPALA & LINTZ				CONTRACT NO.		LOCATION NO.				OF
ENTERED BY	F. LINTZ										SHEETS
CHECKED BY	S. HAAPALA										
PROJ. ENGR.											
REGIONAL ADM.		REVISION		DATE	BY			DATE			DESIGNER NOTES



DESIGNER NOTES