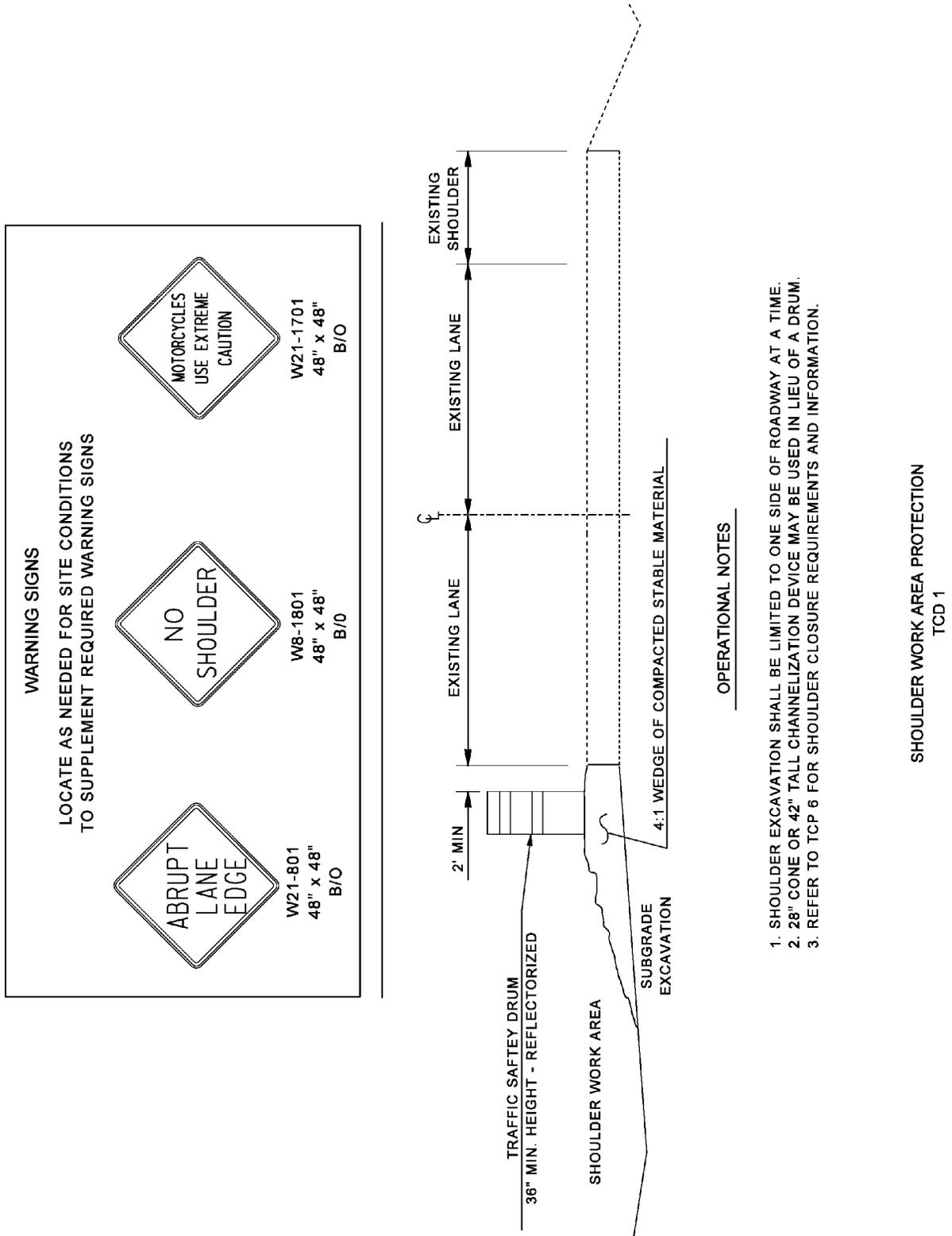


The following detail plans show examples which are difficult to show on other traffic control plans or where additional guidance is necessary.

- TCD 1** *Shoulder Work Area Protection During Non-Working Hours*  
(This detail provides guidance to drop-off protection and providing a recoverable slope if a vehicle were to drive off the edge of the roadway in a work zone during non-work hours.
- TCD 2** *Typical Example – Motorcycle Warning Sign Detail*  
(This detail provides examples for sign placement in using the Motorcycles Use Extreme Caution sign in coordination with specific warning signs. Place the warning sign in advance of the Motorcycle warning sign. (See [RCW 47.36.200](#) and [WAC 468-95-305](#).)
- TCD 3** *Typical Example – Lane Closure With Shift*  
(For use on multi-lane roadways where the work operation goes to the lane line and the traffic is shifted over onto the existing shoulder in order to maintain some buffer space between the work and traffic.) Use caution shifting traffic onto shoulders as traffic may approach a bridge structure and the shoulder may narrow and additional devices may be needed to make drivers aware of the condition
- TCD 4** *Typical Example – Speed Zone Detail for Chip Seal Project*  
(Guidance for the signing requirements in chip seal projects with reduced work zone speed limits.)
- TCD 5** *Typical Example – Work Beyond the Shoulder*  
(Typical example taken from [MUTCD](#) application that details minimum signing requirements for work within 15 feet of the edge of roadway.)
- TCD 6** *Typical Example – Long-Term Shoulder Closure on Freeway*  
(Typical example taken from the [MUTCD](#), this plan depicts the signing and channelizing device requirements for shoulder closure operations, particularly operations with barrier.)
- TCD 7** *Typical Example – Rolling Slowdown*  
(See detailed operational guidance that accompanies this plan.)
- TCD 8** *Typical Example – Emergency Operations*  
(See detailed operational guidance that accompanies this plan.)
- TCD 9** *Temporary Pavement Marking Details*  
(This detail sheet provides descriptions and typical layouts as needed.)

- TCD 10** *Typical Example – Temporary Intersection Pedestrian Traffic Control*  
(This plan depicts typical signing examples for closing of a sidewalk during work zone operations. Specific pedestrian needs must be considered prior to any work beginning that impacts pedestrian pathways. Special attention must be given to pedestrian ADA accommodations. Consult with Region Traffic Office for assistance with specific issues or needs to provide the appropriate pedestrian controls.)
- TCD 11** *Typical Example – Temporary Portable Signal*  
(This plan provides example of the traffic control signing and device requirements for a portable signal operation. Assistance from the Region Traffic Office and the Region Signal Superintendent may be necessary to adequately address the signal timing needs and any specific details in regard to the location of the portable signal system. 1,500 feet maximum between signal heads.)
- TCD 12** *Typical Example – Automated Flagger Assistance Device (AFAD)*  
(This plan provides an example of the traffic control signing and device requirements for an alternating one-way traffic operation that utilizes an automated flagger assistance device. The AFAD device can be used in any alternating one-way traffic operation that is typically flagger controlled, the AFAD is a device that is used as a safety enhancement that enables the human flagger to be physically away from traffic in a safe location and remotely operate the device. 800 feet maximum between AFAD locations.)
- TCD 13** *Typical Example – Work Within a Roundabout*  
(This example provides general guidance on the signing and device requirements for maintenance work in and around a roundabout location. Each roundabout location is unique and a site specific traffic control plan should be developed for the work operation.)
- TCD 14** *Typical Mobile Shoulder Operation With Encroachment on a Two-Lane Roadway*  
(For mobile operations on a rural two-lane, two-way roadway with lane encroachment and limited sight distance.)
- TCD 15** *Typical Temporary Exit Gore Channelization Plan*  
(This example is for use during paving operations in the vicinity of an exit gore, the existing pavement markings are commonly covered by new pavement and the markings are not visible so this detail shows a method to create a temporary physical gore for use until the permanent pavement marking is installed.)



TCD 1 – Shoulder Work Area Protection During Non-Working Hours

W21-801	W8-1801	W8-1	W8-2001

FIELD LOCATE AS NEEDED THROUGH WORK AREA TO SUPPLEMENT MOTORCYCLE WARNING SIGN ( 1 MILE INCREMENTS)

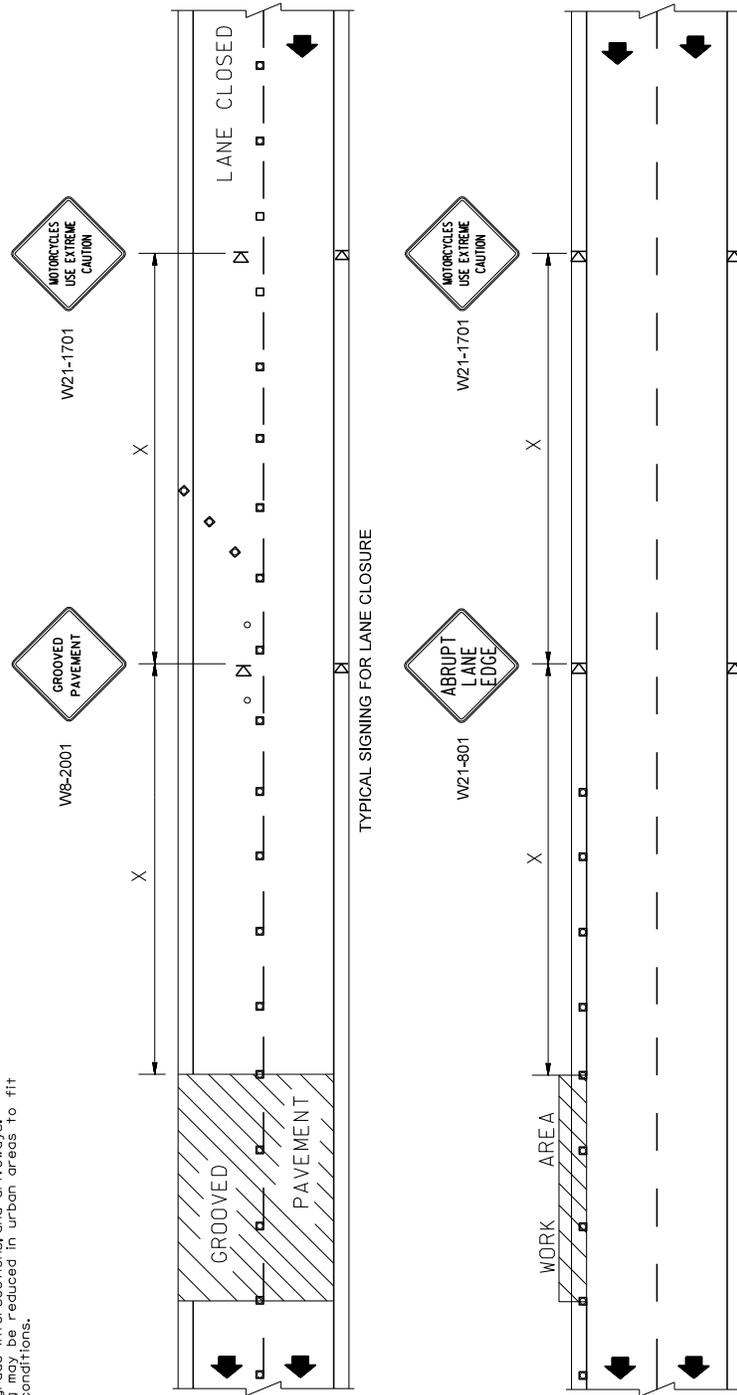
MPH	TAPER	TANGENT
50/70	40	80
35/45	30	60
25/30	20	40

Freeways & Expressways	55/70 MPH	1500'++
Rural Highways	60/65 MPH	800'++
Rural Roads	45/55 MPH	500'++
Rural Roads & Urban Arterials	35/40 MPH	350'++
Rural Roads, Urban Arterials Residential & Business Districts	25/30 MPH	200'++ (2)
Urban Streets	25 MPH or LESS	100'++ (2)

ALL SIGNS ARE 48" x 48" BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED.

(1) All spacing may be adjusted to accommodate interchange structures or other situations where the spacing may be reduced in urban areas to fit roadway conditions.

(2) This spacing may be reduced in urban areas to fit roadway conditions.



TYPICAL SIGNING FOR SHOULDER WORK

NOTES

1. REFER TO OTHER TCP'S FOR TYPICAL LANE CLOSURE AND SHOULDER CLOSURE SIGNING DETAILS, DEVICE SPACING REQUIREMENTS AND TAPER LENGTHS.
2. USE OF APPROPRIATE WARNING SIGNS FOR ROAD CONDITION REQUIRED ALONG WITH THE MOTORCYCLE WARNING SIGN AS PER WAC 468-95-305.

LEGEND

- K SIGN LOCATION
- CHANNELIZING DEVICES

TYPICAL MOTORCYCLE SIGNING DETAIL  
TCD 2

TCD 2 – Typical Example – Motorcycle Warning Sign Detail

**SIGN SPACING = X (feet) (1)**

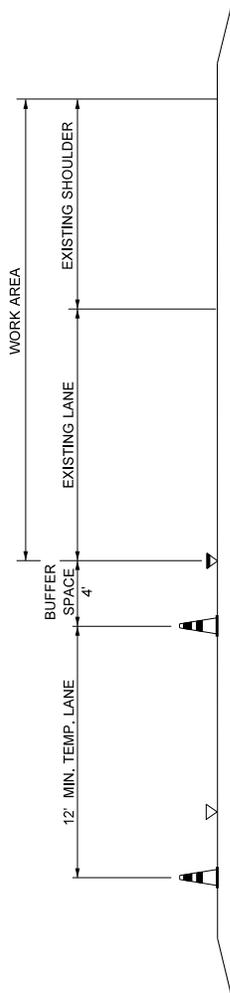
Freeways & Expressways	55/70 MPH	1500'+-
Rural Highways	60/65 MPH	800'+-
Rural Roads	45/55 MPH	500'+-
Rural Roads & Urban Arterials	35/40 MPH	350'+-
Rural Roads, Urban Arterials, Residential & Business Districts	25/30 MPH	200'+- (2)
Urban Streets	25 MPH or LESS	100'+- (2)

(1) All spacing may be adjusted to accommodate interchange ramps, at-grade intersections, and driveways.  
 (2) This spacing may be reduced in urban areas to fit roadway conditions.

**(SAMPLE MESSAGE)**

PCMS	
1	2
LANE CLOSED AHEAD	
ROAD NARROWS	
2.0 SEC	2.0 SEC

Field locate 1 mile +/- in advance of lane closure taper.

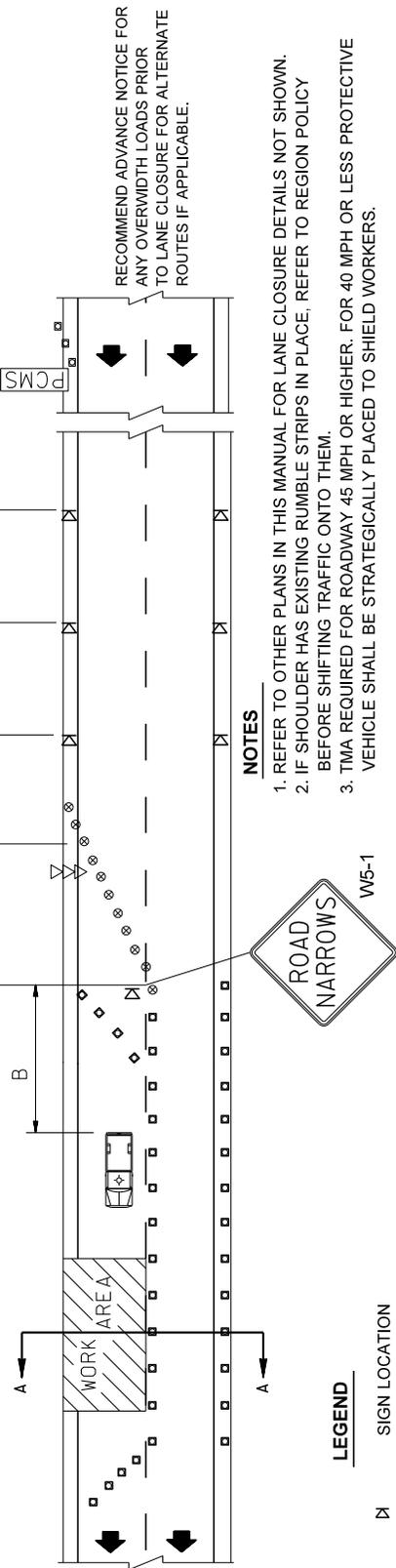


TYPICAL SECTION A-A

- CHANNELIZING DEVICE
- EXISTING EDGE STRIPE
- EXISTING LANE STRIPE

**CHANNELIZING DEVICE SPACING (FEET)**

MPH	TAPER	TANGENT
50/70	40	80
35/45	30	60
25/30	20	40



**NOTES**

1. REFER TO OTHER PLANS IN THIS MANUAL FOR LANE CLOSURE DETAILS NOT SHOWN.
2. IF SHOULDER HAS EXISTING RUMBLE STRIPS IN PLACE, REFER TO REGION POLICY BEFORE SHIFTING TRAFFIC ONTO THEM.
3. TMA REQUIRED FOR ROADWAY 45 MPH OR HIGHER. FOR 40 MPH OR LESS PROTECTIVE VEHICLE SHALL BE STRATEGICALLY PLACED TO SHIELD WORKERS.

**LEGEND**

- SIGN LOCATION
- ARROW BOARD
- CHANNELIZING DEVICES
- TRAFFIC SAFETY DRUMS
- PROTECTIVE VEHICLE
- PORTABLE CHANGEABLE MESSAGE SIGN

**BUFFER DATA**

LONGITUDINAL BUFFER SPACE = B	
SPEED (MPH)	LENGTH (feet)
25	200
30	250
35	305
40	360
45	425
50	495
55	570
60	645
65	730

**MINIMUM TAPER LENGTH = L (feet)**

LANE WIDTH (feet)	25	30	35	40	45	50	55	60	65	70
10	105	150	205	270	450	500	550	-	-	-
11	115	165	225	295	495	550	605	660	-	-
12	125	180	245	320	540	600	660	720	780	840

TYPICAL SHORT DURATION LANE CLOSURE WITH SHIFT  
TCD 3

TCD 3 – Typical Example – Lane Closure With Shift

DESIRED REDUCED SPEED	APPROACH SPEED - (POSTED SPEED LIMIT) (MPH) = D ON PLAN SHEET									
70	65	60	55	50	45	40	35	30		
65	--	--	--	--	--	--	--	--	--	--
60	--	390	--	--	--	--	--	--	--	--
55	--	660	350	--	--	--	--	--	--	--
50	--	910	600	310	--	--	--	--	--	--
45	--	1140	820	540	270	--	--	--	--	--
40	--	1340	1030	740	470	230	--	--	--	--
35	--	1520	1200	920	650	410	200	--	--	--
30	--	1670	1310	1070	810	570	350	160	--	--
25	--	1800	1390	1200	940	700	480	290	120	--
20	--	1910	1600	1310	1040	800	590	390	230	--

DISTANCES DERIVED FROM MUTCD CHAPTER 2. GOOD ENGINEERING PRACTICE INDICATES THAT SPEED REDUCTIONS SHOULD NOT BE GREATER THAN 15 MPH. \* THESE DISTANCES ARE SPEED REDUCTION INTERVALS GREATER THAN 15 MPH AND THE SPEED REDUCTION SHOULD BE STEPPED DOWN INCREMENTALLY TO SMOOTH OUT TRANSITION.

SIGN SPACING = X (feet) (1)	
Rural Highways	60/65 MPH 800'+-
Rural Roads	45/55 MPH 500'+-
Rural Roads & Urban Arterials	35/40 MPH 350'+-
Rural Roads, Urban Arterials Residential & Business Districts	25/30 MPH 200'+- (2)
Urban Streets	25 MPH or LESS 100'+- (2)

ALL SIGNS ARE 48" x 48" BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED.

- (1) All spacing may be adjusted to accommodate interchange ramps, grade intersections and driveways.
- (2) This spacing may be reduced in urban areas to fit roadway conditions.

CHIP SEAL PROJECT

NEXT X MILES

AUG XX TO AUG XX

SP-1

48"X60"

(SAMPLE MESSAGE)

PCMS	1	2
CHIP SEAL PROJECT TO AUG XX		
2.0 SEC		2.0 SEC

OR

TO BE FIELD LOCATED

OR OTHER APPROPRIATE WARNING SIGN AS NEEDED TO SUPPLEMENT W21-1701 FOR CONDITIONS AT THE WORKSITE. SEE TCP'S FOR RECOMMENDED SIGNS.

SP-2  
36"X48"  
B/O

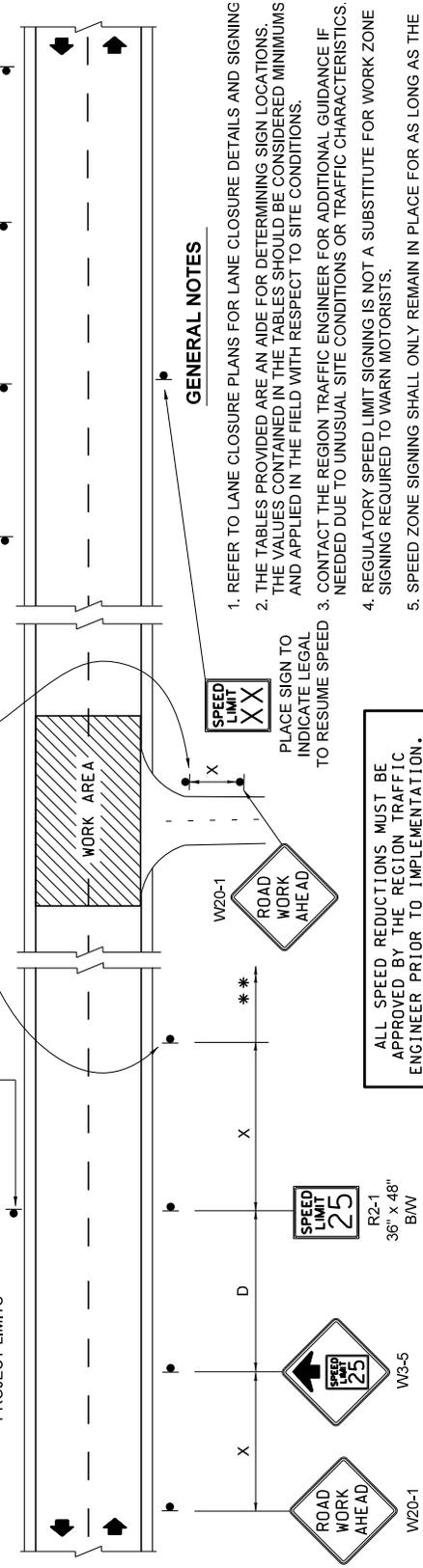
W21-1701  
48" x 48"  
B/O

PLACE SIGN TO INDICATE LEGAL TO RESUME SPEED

DO NOT PASS

R4-1  
36"X48"  
B/W

INSTALL AS REQUIRED THROUGHOUT PROJECT LIMITS



**GENERAL NOTES**

- REFER TO LANE CLOSURE PLANS FOR LANE CLOSURE DETAILS AND SIGNING.
- THE TABLES PROVIDED ARE AN AIDE FOR DETERMINING SIGN LOCATIONS. THE VALUES CONTAINED IN THE TABLES SHOULD BE CONSIDERED MINIMUMS AND APPLIED IN THE FIELD WITH RESPECT TO SITE CONDITIONS.
- CONTACT THE REGION TRAFFIC ENGINEER FOR ADDITIONAL GUIDANCE IF NEEDED DUE TO UNUSUAL SITE CONDITIONS OR TRAFFIC CHARACTERISTICS.
- REGULATORY SPEED LIMIT SIGNING IS NOT A SUBSTITUTE FOR WORK ZONE SIGNING REQUIRED TO WARN MOTORISTS.
- SPEED ZONE SIGNING SHALL ONLY REMAIN IN PLACE FOR AS LONG AS THE REDUCED SPEED CONDITION APPLIES.
- CONTACT THE REGION TRAFFIC OFFICE FOR SPECIAL SIGN ORDERS, SPEED REDUCTION NOTICES, ETC.
- SEE TCD9 FOR TEMPORARY PAVEMENT MARKING DETAILS.
- MOTORCYCLE WARNING SIGNS ARE REQUIRED AS PER WAC 468-95-305.

ALL SPEED REDUCTIONS MUST BE APPROVED BY THE REGION TRAFFIC ENGINEER PRIOR TO IMPLEMENTATION.

\*\* CONTINUE SIGNS AS NEEDED BASED ON REQUIRED ROADWAY CONDITION WARNING AS SHOWN ON THE APPROPRIATE TCP.

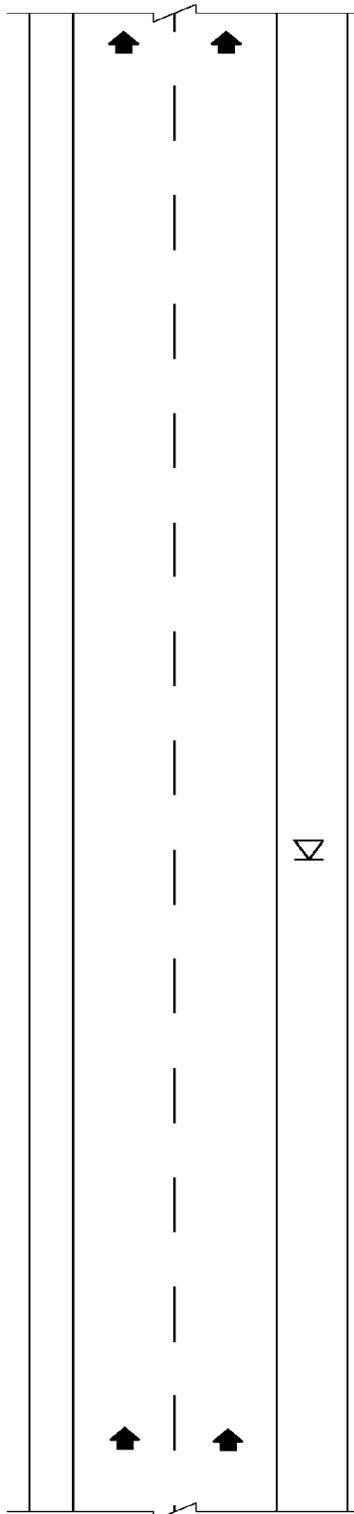
**LEGEND**

- SIGN LOCATION
- ▨ WORK AREA LIMITS

TYPICAL SPEEDZONE DETAIL  
CHIP SEAL PROJECTS  
TCD 4

SPEED LIMIT REDUCTION SHALL CONFORM TO TRAFFIC MANUAL REQUIREMENTS SHOWN IN APPENDIX 5.B

TCD 4 – Typical Example – Speed Zone Detail for Chip Seal Project



SIGN SPACING = X (feet) ( 1 )		
Freeways & Expressways	55/70 MPH	1500'+-
Rural Highways	60/65 MPH	800'+-
Rural Roads	45/55 MPH	500'+-
Rural Roads & Urban Arterials	35/40 MPH	350'+-
Rural Roads, Urban Arterials Residential & Business Districts	25/30 MPH	200'+- (2)
Urban Streets	25 MPH or LESS	100'+- (2)
ALL SIGNS ARE 48" x 48" BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED.		

(1) All spacing may be adjusted to accommodate interchange ramps, at-grade intersections, and driveways.  
 (2) This spacing may be reduced in urban areas to fit roadway conditions.

**LEGEND**

▽ SIGN LOCATION

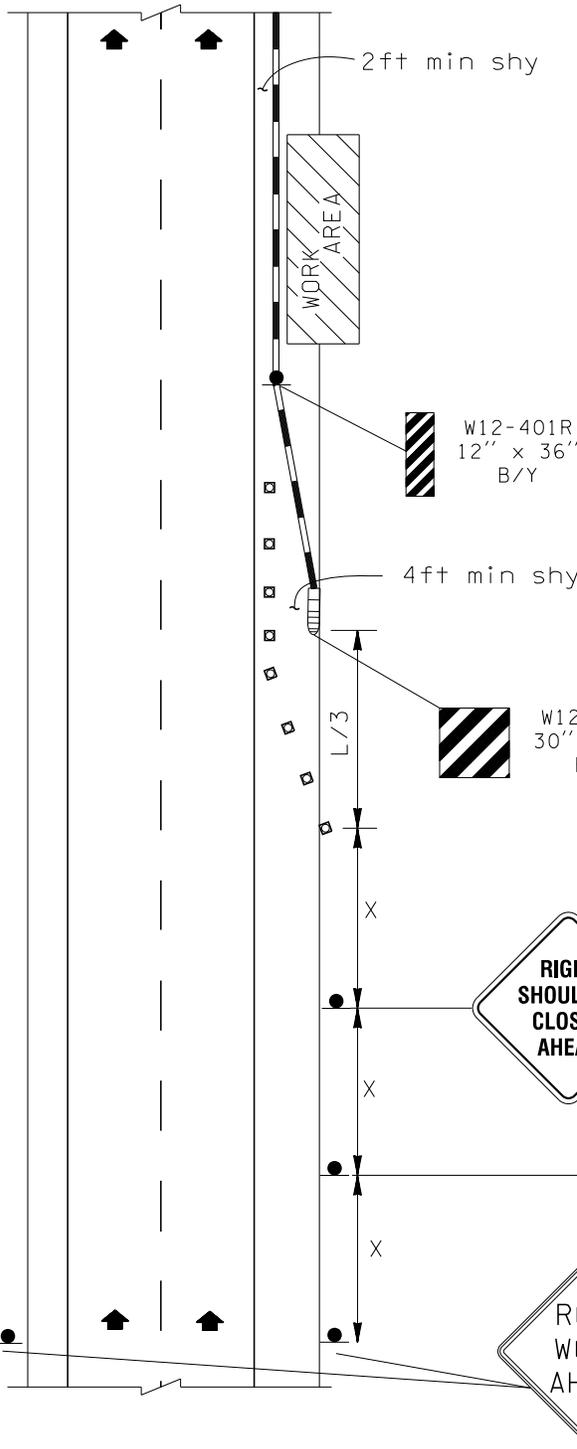


W20-1  
48" x 48"  
B/O

**NOTES:**

1. THE ROAD WORK AHEAD SIGN MAY BE REPLACED WITH OTHER APPROPRIATE SIGNS SUCH AS SHOULDER WORK.
2. THE ROAD WORK AHEAD SIGN MAY BE OMITTED WHERE THE WORK SPACE IS BEHIND BARRIER, MORE THAN 24 INCHES BEHIND THE CURB OR 15 FEET OR MORE FROM THE EDGE OF ANY ROADWAY.
3. IF WORK VEHICLES ARE ON THE SHOULDER, A SHOULDER WORK SIGN MAY BE USED. FOR MOWING OPERATIONS THE SIGN MOWING AHEAD MAY BE USED.
4. A GENERAL WARNING SIGN SUCH AS ROAD MACHINERY AHEAD SHOULD BE USED IF WORKERS AND EQUIPMENT MUST OCCASIONALLY MOVE ONTO THE SHOULDER.
5. WORK OPERATIONS SUCH AS MOWING WHERE THE MOWER IS OFF THE SHOULDER IS ALLOWED UNDER THIS PLAN.
6. THE PARKING OF ADDITIONAL EQUIPMENT USED TO LOAD/UNLOAD EQUIPMENT ARE NOT CONSIDERED A WORK ZONE OF ITS OWN AND CAN BE PARKED ON THE SHOULDER BUT NEEDS TO HAVE AT LEAST 3 DEVICES TO CLOSE THE SHOULDER. REFER TO 3.1 FOR ADDITIONAL INFORMATION.

**TCD 5 – Typical Example – Work Beyond the Shoulder**



SIGN SPACING = X (feet) (1)		
Freeways & Expressways	55/70 MPH	1500'+-
Rural Highways	60/65 MPH	800'+-
Rural Roads	45/55 MPH	500'+-
Rural Roads & Urban Arterials	35/40 MPH	350'+-
Rural Roads, Urban Arterials Residential & Business Districts	25/30 MPH	200'+- (2)
Urban Streets	25 MPH or LESS	100'+- (2)

(1) All spacing may be adjusted to accommodate interchange ramps, at-grade intersections, and driveways.  
 (2) This spacing may be reduced in urban areas to fit roadway conditions.

LANE WIDTH (feet)	MINIMUM TAPER LENGTH = L (feet)									
	Posted Speed (mph)									
10	25	30	35	40	45	50	55	60	65	70
	-	-	-	270	450	500	550	-	-	-
11	25	30	35	40	45	50	55	60	65	70
	-	-	-	295	495	550	605	660	-	-
12	25	30	35	40	45	50	55	60	65	70
	-	-	-	320	540	600	660	720	780	840

LEGEND

- POST MOUNTED SIGN
- ☒ ☒ ☒ CHANNELIZING DEVICES
- ▭▭▭▭▭▭ TEMPORARY IMPACT ATTENUATOR
- ▬▬▬▬▬▬ TEMPORARY CONCRETE BARRIER

CHANNELIZING DEVICE SPACING (feet)		
MPH	TAPER	TANGENT
50/70	40	80
35/45	30	60

BARRIER FLARE RATES	
MPH	TAPER
70	18:1
60	16:1
55	14:1
50	12:1
45	11:1
40 OR BELOW	10:1

NOTES:

- BARRIER END MUST BE TREATED WITH APPROVED TEMPORARY IMPACT ATTENUATOR APPROPRIATE FOR THE SPECIFIC LOCATION.

TCD 6 – Typical Long-Term Shoulder Closure on High Speed Roadway

## TCD 7 – Rolling Slowdown

A rolling slowdown is a legitimate form of traffic control commonly practiced by the WSP and highway maintenance crews. This use is valuable for emergency, or **very specific** short duration closures (e.g. to pick debris from the roadway, to push a blocking disabled to the shoulder, or to pull power lines across the roadway). The traffic control vehicles form a moving blockade across all lanes, which reduce traffic speeds and create a large gap in traffic, or clear area, allowing very short-term work to be accomplished **without completely stopping the traffic**.

Other traditional forms of traffic control such as lane closures should be considered first and as the primary choice when possible. If the slowdown is to be a scheduled operation, then the Regional Traffic Office needs to be contacted with a work request so a site specific traffic control plan (TCP) can be developed and/or reviewed and approved. The gap in traffic created by the rolling slowdown, and other traffic issues, should be addressed on an approved TCP. Also, use of WSP is encouraged whenever possible, at a minimum coordination with WSP is necessary.

In the event of debris in the roadway, a blocking disabled vehicle, or other **emergency**, the use of experience and resources at hand, along with sound judgment and common sense, will suffice in lieu of an approved, site specific, TCP. **TCD 7** has been developed as a guideline to represent the basic requirements for performing a safe and effective rolling slowdown. Site specific TCPs can be developed based on this plan.

Equipment availability is a prime consideration. Before starting this operation, ensure there are at least one traffic control vehicle (with flashing amber lights) per two lanes, **and** one vehicle to cover every point of access onto the “rolling slowdown” segment of roadway. (Only during emergencies should less than one traffic control vehicle per lane be considered.) Truck mounted PCMS boards stating, “Slow or Stopped Vehicles” are very helpful. **Be sure that every crewmember participating is well briefed and knows what is needed from them. Good communications for this operation are essential!**

The traffic control vehicles leading the rolling slowdown must enter the roadway far enough upstream from the work operation site to allow a clear area in front of them to develop. The traffic control vehicles will work into position so that each lane is controlled. As in every other form of traffic control, sight distance is important, so that drivers are not surprised. While traveling at a fixed and reduced rate of speed, a gap in traffic must be created which is long enough to provide the estimated time needed for the work to be done.

A separate traffic control vehicle, “chase vehicle,” shall follow the slowest, or last, vehicle ahead of the blockade. When that last vehicle passes, the crew can begin the work operation.

All ramps and entrances to the roadway between the moving blockade and work operation must be temporarily closed using traffic control equipment and personnel. Each of those ramps must remain closed until the crew doing the work gives the “all clear” signal, **or** until the front of the moving blockade passes the closed on-ramp(s).

Radio communications between the work crew and the moving blockade are required so the speed of the blockade can be adjusted, if necessary, to increase or decrease the closure time. Release traffic only after you have confirmation that all workers and their vehicles are clear of the roadway.

### **Rolling Slowdown Calculations**

#### **Known:**

T = Time needed with no traffic (in minutes)

V<sub>s</sub> = Speed of slowdown vehicles (in mph) 20 mph minimum recommended

V<sub>c</sub> = Speed of chaser vehicle in front of slowdown (in mph) generally it should be the posted speed

#### **Calculations:**

G = Gap needed (in miles)

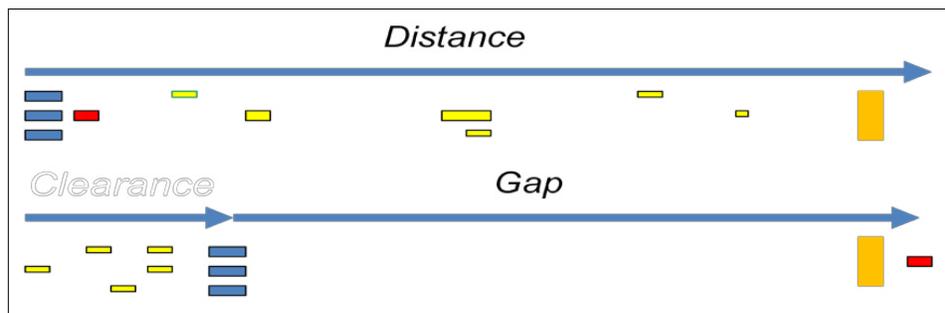
$$G = T (V_s/60)$$

C = Clearance time needed to create the gap (in minutes)

$$C = G / (V_c/60 - V_s/60)$$

D = Distance ahead of the work area to start the slowdown (in miles)

$$D = C (V_c/60)$$



#### **Example:**

You need a 5 minute gap on a 60 mph freeway to cross a large piece of equipment into the median work area, so you propose a 20 mph rolling slowdown during the off-peak or lowest traffic volume hours for the freeway.

$$G = 5 (20/60) = 1.67 \text{ miles}$$

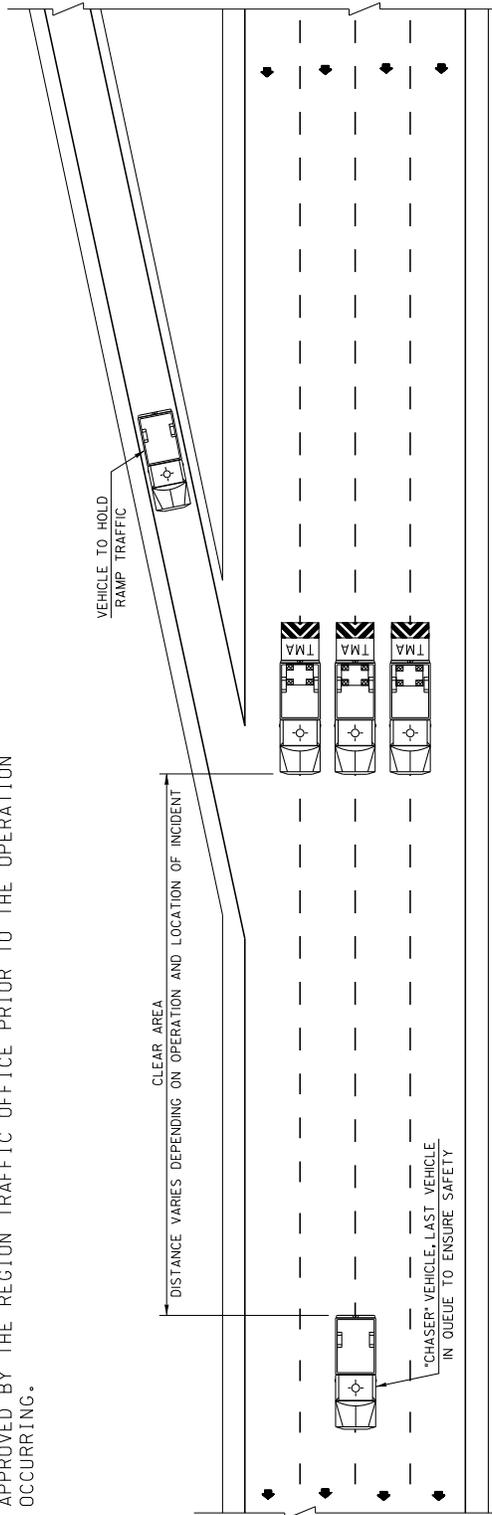
$$C = 1.67 / (60-20/60) = 2.5 \text{ minutes}$$

$$D = 2.5 (60/60) = 2.5 \text{ miles}$$

#### **Links:**

For WSDOT maintenance, see the Chapter 6 of this manual.

THIS PLAN DEPICTS THE MINIMUM REQUIREMENTS TO PERFORM AN EMERGENCY ROLLING SLOWDOWN. IF THE SLOWDOWN IS, OR CAN BE, A PLANNED EVENT, THEN A SITE SPECIFIC TRAFFIC CONTROL PLAN SHOULD BE DEVELOPED AND APPROVED BY THE REGION TRAFFIC OFFICE PRIOR TO THE OPERATION OCCURRING.



(SAMPLE MESSAGE)

TRUCK MOUNTED PCMS	
1	2
SLOW OR STOPPED VEHICLES	DO NOT PASS
2.0 SEC	2.0 SEC

PCMS	
1	2
CAUTION SLOWING STOPPED TRAFFIC VEHICLES	OR
2.0 SEC	2.0 SEC

FIELD LOCATE 1 MILE (++) IN ADVANCE OF LANE CLOSURE

**LEGEND**

-  TRUCK MOUNTED ATTENUATOR (RECOMMENDED)
-  WARNING BEACON - REQUIRED
-  ARROW BOARD CAUTION MODE (REQUIRED)

**OPERATIONAL NOTES**

1. ALL WORK VEHICLES SHALL USE WARNING BEACONS.
2. THE NUMBER OF VEHICLES SHOWN IS A MINIMUM. IF POSSIBLE USE ONE VEHICLE PER LANE DURING CLOSURE.
3. NOTIFY WSP PRIOR TO OPERATION SO THEY ARE AWARE OF OPERATION.
4. ALL ON-RAMP TRAFFIC SHALL BE STOPPED DURING SLOWDOWN.
5. USE CALCULATION CHART TO DETERMINE CLEAR AREA.

**TYPICAL ROLLING SLOWDOWN  
TCD 7**

**TCD 7 – Typical Example – Rolling Slowdown**

## TCD 8 – Emergency Operations

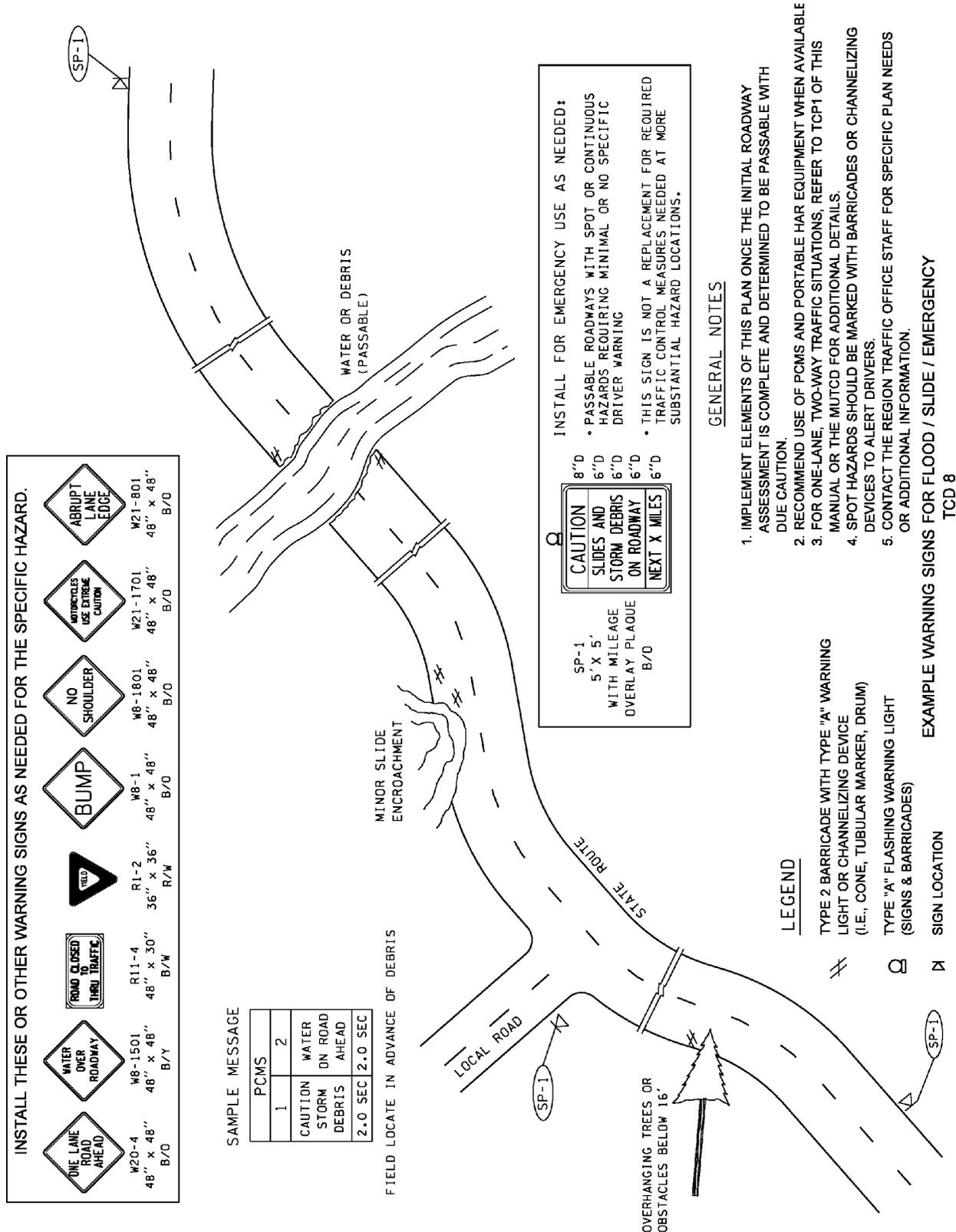
The immediate response to an emergency situation must, by necessity, make use of whatever devices and equipment are available. Assistance from the Washington State Patrol and WSDOT Incident Response Team may be appropriate. The use of flares is allowed unless flammable material is present, electronic flares or glow sticks are an option for this condition.

Implement the appropriate traffic control plan (lane closure, etc.) if the situation is expected to last longer than 60 minutes. This allows for a short duration operation, until traffic control assistance arrives.

It is important to differentiate between an actual emergency and an emergent condition. An actual emergency requires an immediate response to save lives or prevent serious injury using whatever resources are available, usually in response to a crash or incident. An emergent condition requires an expedient yet planned response to a situation that may have the potential to cause a crash, but the crash has not yet occurred or a crash or other event has caused damage needing repair after the crash event. Most “call outs” or damage reports fall into the emergent condition category and although serious to varying degrees, still allow some period of time to plan a reasonable short duration work zone response, even if additional resources are needed once the condition is evaluated on site.

[TCD 8](#) reflects various conditions and measures that might be applied as part of an emergency response for a natural disaster. More commonly, emergencies are those caused by vehicle crashes, breakdowns or spilled or lost cargo. Response to these types of emergencies is urgent and not specifically addressed by work zone standards. Refer to WSDOT Incident Response Program for guidance. [Refer to Section 3.2](#) for additional guidance.

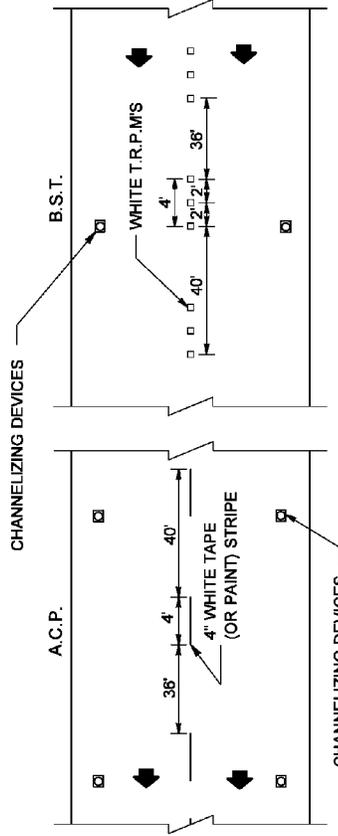
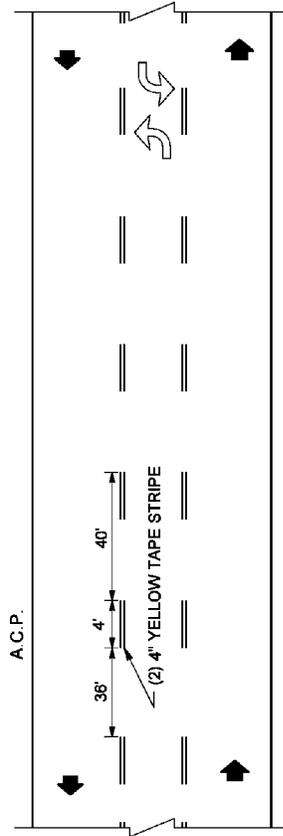
**Response to an emergency situation is inherently more dangerous than planned situations. Do not expose yourself to a life-threatening situation. Wait for assistance and protect yourself at all times.**



TCD 8 – Typical Example – Emergency Operations

WORK OPERATIONS THAT REMOVE OR OBSCURE EXISTING PAVEMENT MARKINGS MUST PROVIDE FOR TEMPORARY MARKINGS UNTIL THE PERMANENT MARKINGS ARE APPLIED. TEMPORARY MARKINGS MAY BE USED UNTIL IT IS PRACTICAL AND POSSIBLE TO INSTALL PERMANENT MARKINGS. THE DETAILS BELOW SHOW VARIOUS COMMON APPLICATIONS. CONTACT THE REGION TRAFFIC OFFICE FOR ASSISTANCE WITH MORE COMPLEX SITUATIONS.

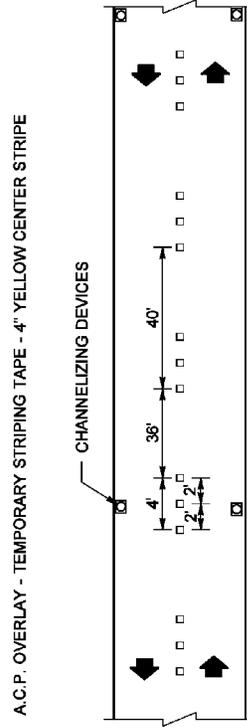
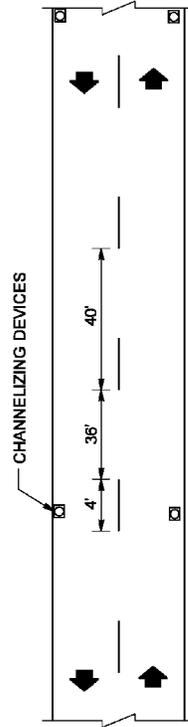
**MULTI-LANE ROADWAYS**



**2 LANE ROADWAYS**

A.C.P. OVERLAY - TEMPORARY STRIPING TAPE SHALL BE INSTALLED IN CONJUNCTION WITH "PASS WITH CARE" AND "DO NOT PASS" SIGN LOCATIONS.

T.R.P.M. = TEMPORARY RAISED PAVEMENT MARKER



TEMPORARY EDGE STRIPES ARE NOT REQUIRED FOR THE ABOVE SITUATIONS BUT IF USED, T.R.P.M.'S MAY BE USED ON A PATTERN SPACING OF 50'.C. TO SIMULATE A SOLID LINE. TEMPORARY ROADSIDE DELINEATION WITH CHANNELIZATION DEVICES SHOULD BE CONSIDERED, BUT ARE OPTIONAL. DO NOT USE A "SKIP" PATTERN OF TAPE STRIPE TO SIMULATE AN EDGE STRIPE.

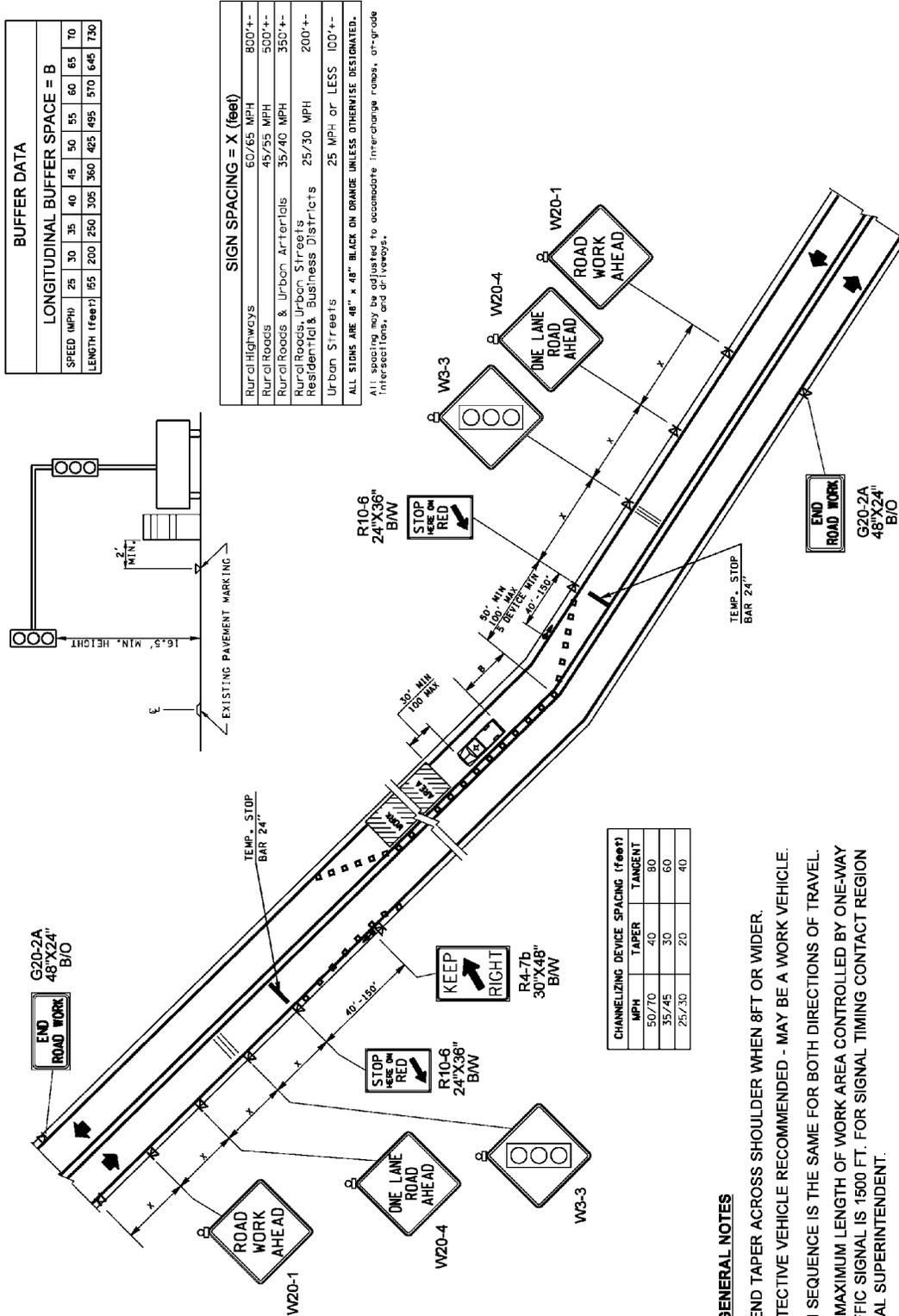
FOR LONG TERM PROJECTS, A TEMPORARY CHANNELIZATION/PAVEMENT MARKING PLAN SHOULD BE DEVELOPED.

**CHANNELIZATION DEVICE SPACING - TANGENT 200' +-  
CURVES 100' +- O.C.  
TAPERS 1/2 L**

TEMPORARY PAVEMENT MARKING DETAILS  
TCD 9

**TCD 9 – Temporary Pavement Marking Details**





**BUFFER DATA**

LONGITUDINAL BUFFER SPACE = B

SPEED (MPH)	25	30	35	40	45	50	55	60	65	70
LENGTH (feet)	155	200	250	305	360	425	495	570	645	730

SIGN SPACING = X (feet)

Rural Highways	60/65 MPH	800'±
Rural Roads	45/55 MPH	500'±
Rural Roads & Urban Arterials	35/40 MPH	350'±
Rural Roads, Urban Streets, Residential & Business Districts	25/30 MPH	200'±
Urban Streets	25 MPH or LESS	100'±

ALL SIGNS ARE 48" x 48" BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED.

All spacing may be adjusted to accommodate interchange ramps, at-grade intersections, and flyovers.

CHANNELIZING DEVICE SPACING (feet)

MPH	TAPER	TANGENT
50/70	40	80
35/45	30	60
25/30	20	40

**GENERAL NOTES**

1. EXTEND TAPER ACROSS SHOULDER WHEN 8FT OR WIDER.
2. PROTECTIVE VEHICLE RECOMMENDED - MAY BE A WORK VEHICLE.
3. SIGN SEQUENCE IS THE SAME FOR BOTH DIRECTIONS OF TRAVEL.
4. THE MAXIMUM LENGTH OF WORK AREA CONTROLLED BY ONE-WAY TRAFFIC SIGNAL IS 1500 FT. FOR SIGNAL TIMING CONTACT REGION SIGNAL SUPERINTENDENT.
5. INSTALL NO PASSING STRIPE IF NOT ALREADY IN PLACE.
6. POST MOUNT SIGNS FOR LOCATIONS IN PLACE LONGER THAN 3 DAYS.
7. TEMPORARY LIGHTING IS REQUIRED AT STOP BARS DURING WORK OPERATIONS AT NIGHT.
8. RECOMMEND USING TEMPORARY RUMBLE STRIP TAPE AT SIGNAL AHEAD SIGNS.

THIS PLAN MAY NEED TO BE ADJUSTED TO FIT SITE CONDITIONS. REFER TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) PART 6 OR CONTACT THE REGION TRAFFIC ENGINEER FOR SPECIFIC QUESTIONS.

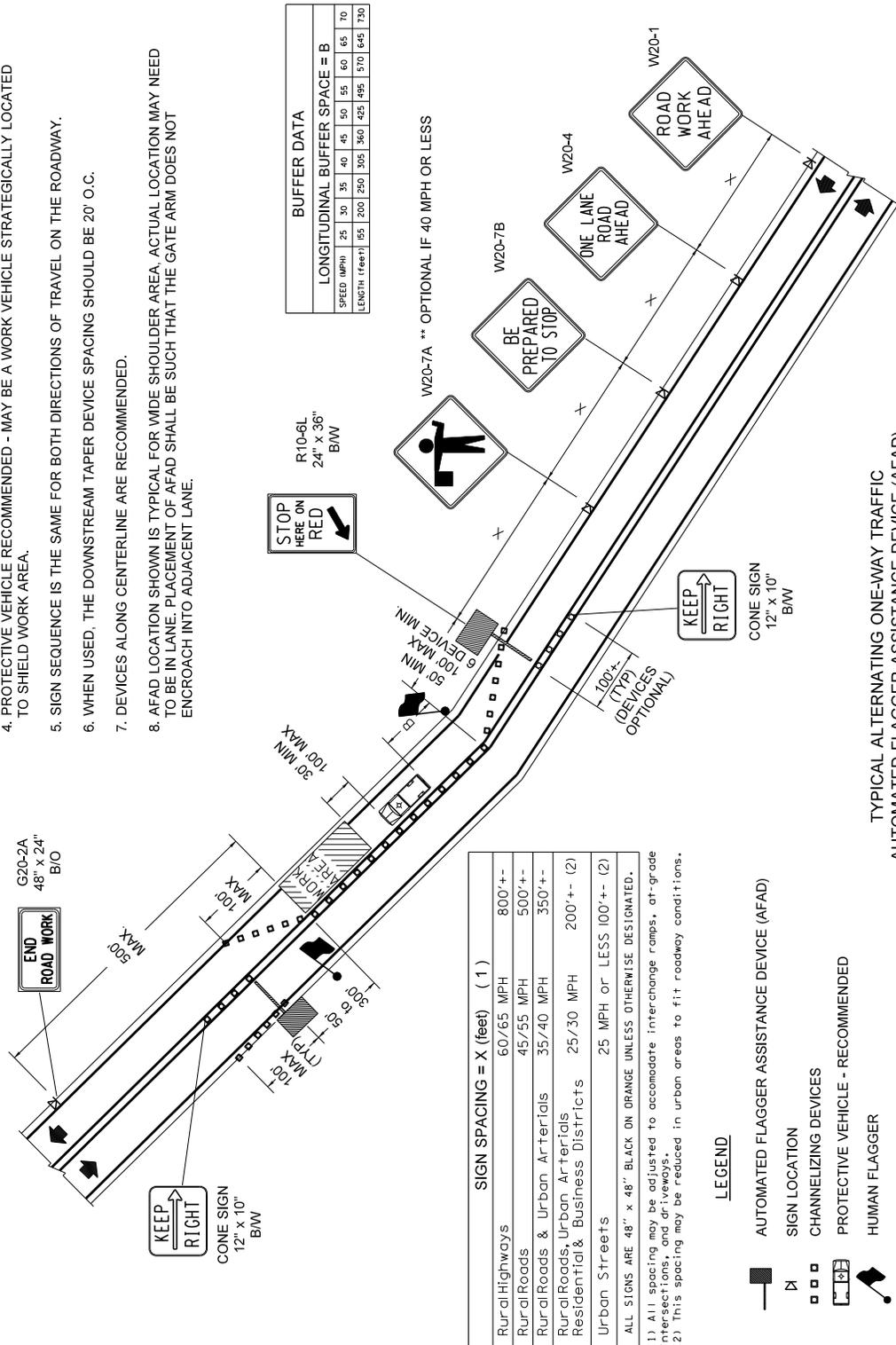
- LEGEND**
- ⊗ SIGN LOCATION
  - CHANNELIZING DEVICES
  - ▣ PROTECTIVE VEHICLE
  - PORTABLE SIGNAL
  - ⊕ TYPE "B" WARNING LIGHT

TYPICAL ALTERNATING ONE-WAY TRAFFIC  
PORTABLE TEMPORARY SIGNAL CONTROLLED  
TCD 11

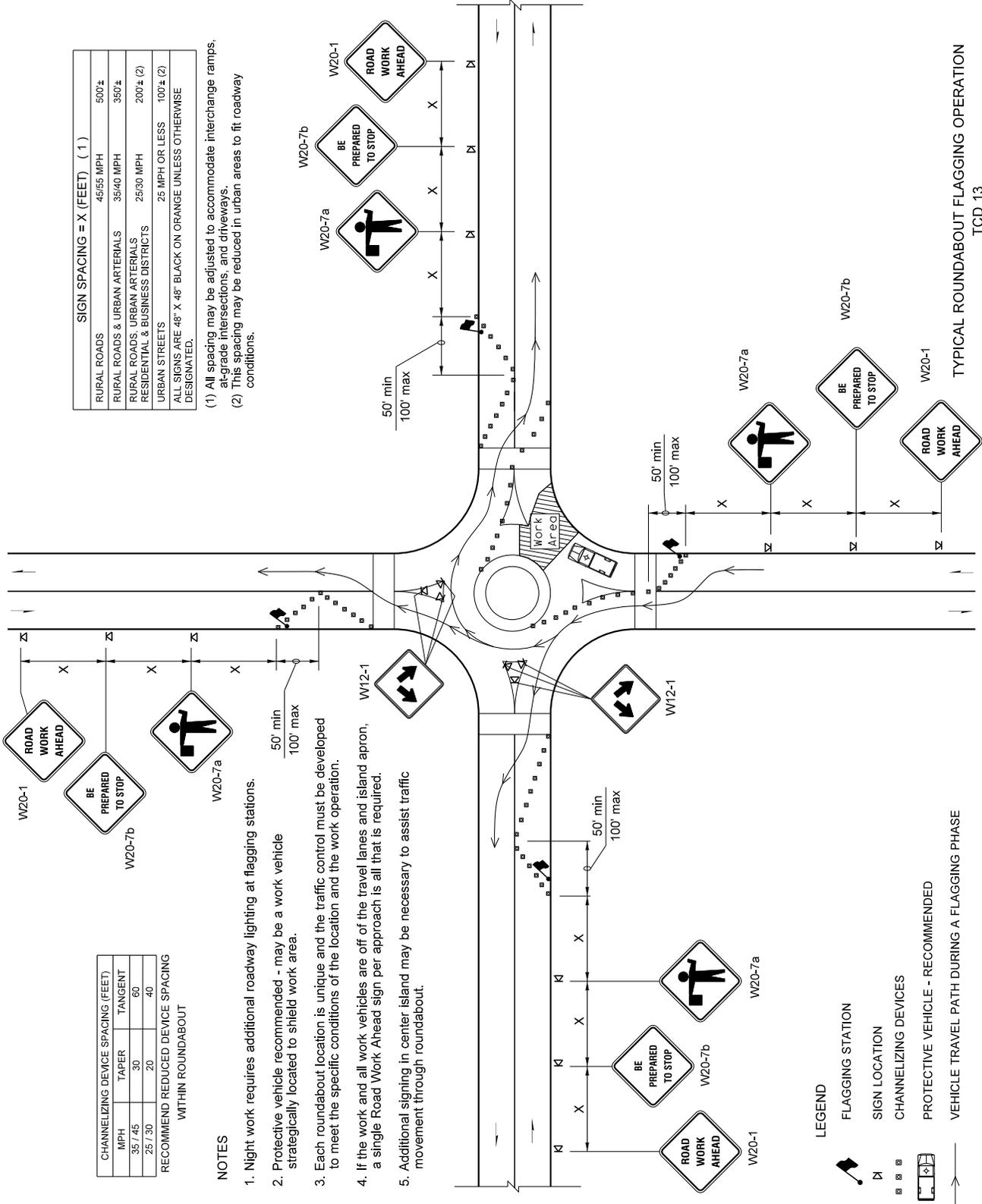
TCD 11 – Typical Example – Temporary Portable Signal

**GENERAL NOTES**

1. HUMAN FLAGGER IS REQUIRED TO OPERATE EACH AFAD IN USE. THE HUMAN FLAGGER SHALL BE SAFELY LOCATED OUT OF THE LANE OF TRAFFIC TO REMOTELY OPERATE THE DEVICE WHILE MAINTAINING VISUAL CONTACT WITH THE TRAFFIC.
2. NIGHTWORK REQUIRES ADDITIONAL ROADWAY LIGHTING AT FLAGGING STATIONS.
3. RECOMMEND EXTENDING CHANNELIZING DEVICE TAPER ACROSS SHOULDER.
4. PROTECTIVE VEHICLE RECOMMENDED - MAY BE A WORK VEHICLE STRATEGICALLY LOCATED TO SHIELD WORK AREA.
5. SIGN SEQUENCE IS THE SAME FOR BOTH DIRECTIONS OF TRAVEL ON THE ROADWAY.
6. WHEN USED, THE DOWNSTREAM TAPER DEVICE SPACING SHOULD BE 20' O.C.
7. DEVICES ALONG CENTERLINE ARE RECOMMENDED.
8. AFAD LOCATION SHOWN IS TYPICAL FOR WIDE SHOULDER AREA. ACTUAL LOCATION MAY NEED TO BE IN LANE. PLACEMENT OF AFAD SHALL BE SUCH THAT THE GATE ARM DOES NOT ENCROACH INTO ADJACENT LANE.



**TCD 12 – Typical Example – Automated Flagger Assistance Device (AFAD)**



SIGN SPACING = X (FEET) (1)

RURAL ROADS	45/55 MPH	500±
RURAL ROADS & URBAN ARTERIALS	35/40 MPH	350±
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25/30 MPH	200± (2)
URBAN STREETS	25 MPH OR LESS	100± (2)

ALL SIGNS ARE 48" X 48" BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED.

- (1) All spacing may be adjusted to accommodate interchange ramps, at-grade intersections, and driveways.
- (2) This spacing may be reduced in urban areas to fit roadway conditions.

CHANNELIZING DEVICE SPACING (FEET)

MPH	TAPER	TANGENT
35 / 45	30	60
25 / 30	20	40

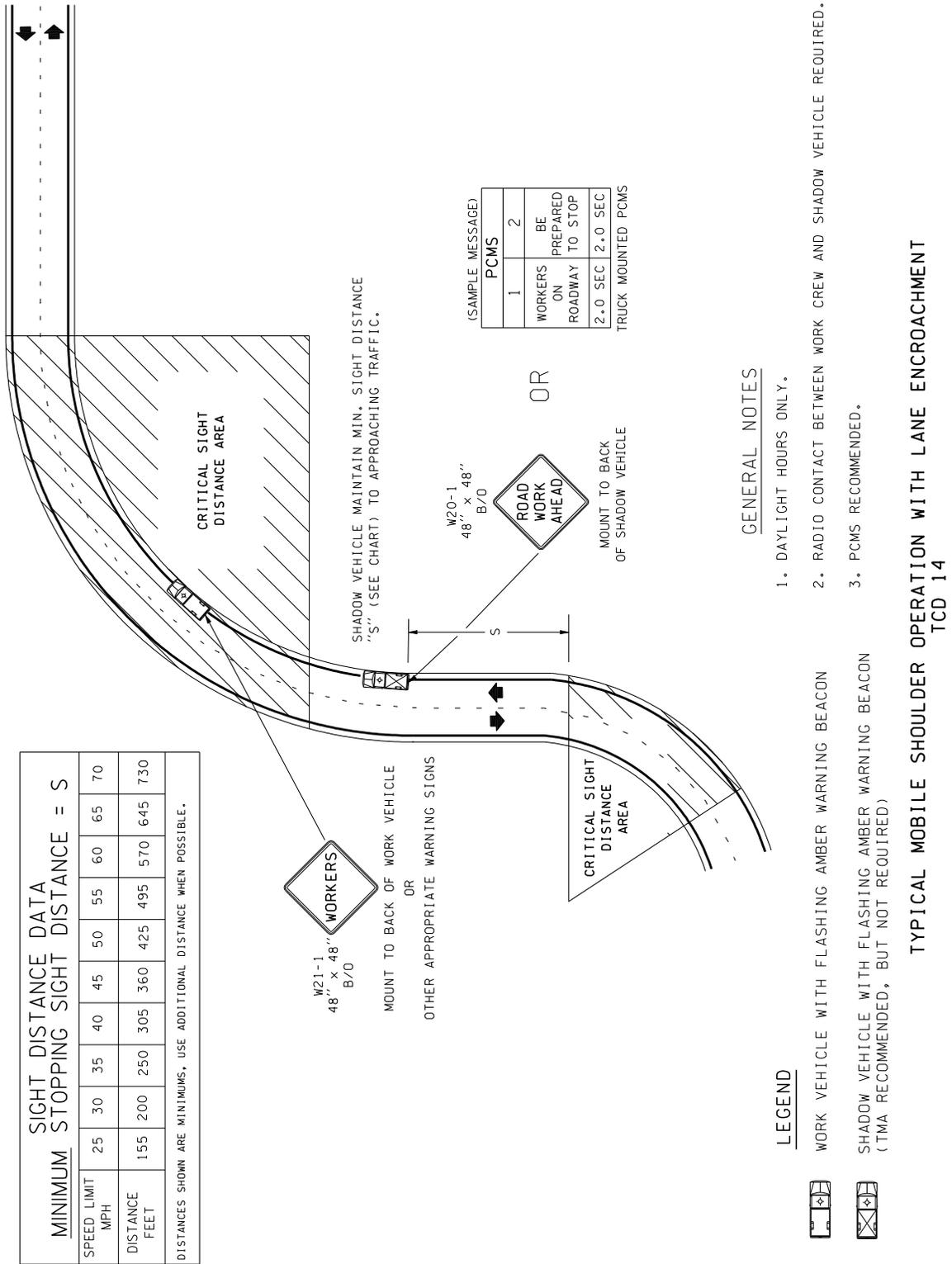
RECOMMEND REDUCED DEVICE SPACING WITHIN ROUNDABOUT

NOTES

1. Night work requires additional roadway lighting at flagging stations.
2. Protective vehicle recommended - may be a work vehicle strategically located to shield work area.
3. Each roundabout location is unique and the traffic control must be developed to meet the specific conditions of the location and the work operation.
4. If the work and all work vehicles are off of the travel lanes and island apron, a single Road Work Ahead sign per approach is all that is required.
5. Additional signing in center island may be necessary to assist traffic movement through roundabout.

TCD 13 – Typical Example – Work Within a Roundabout

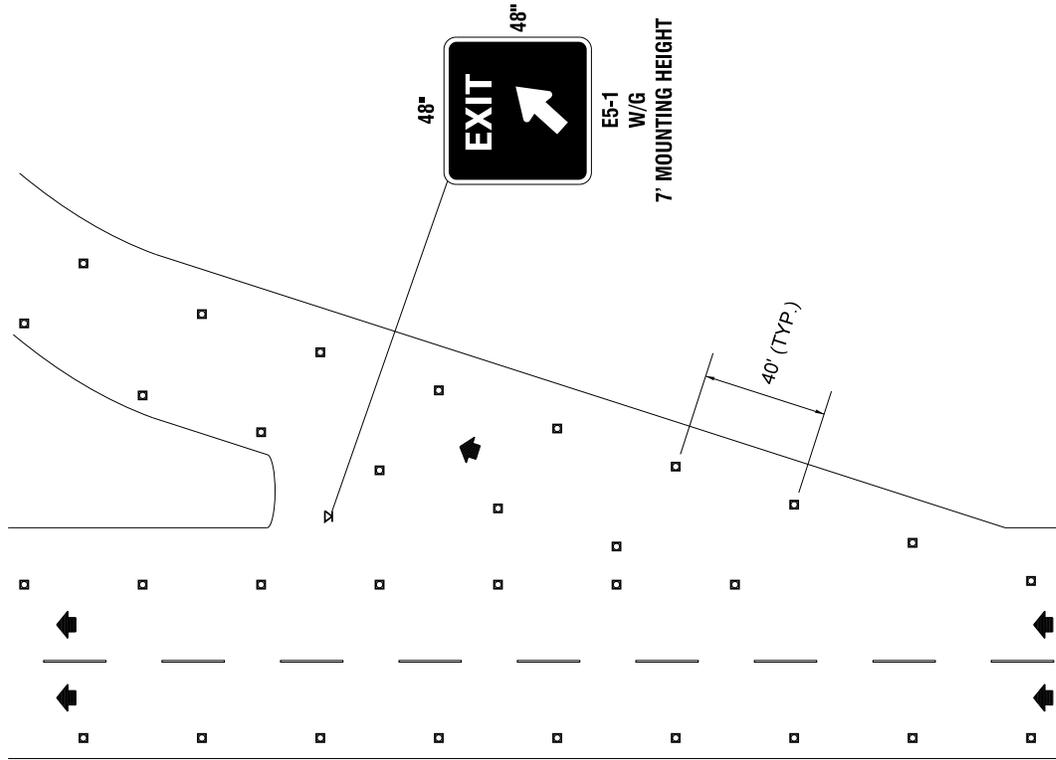
TYPICAL ROUNDABOUT FLAGGING OPERATION  
TCD 13



TCD 14 – Typical Mobile Shoulder Operation With Encroachment on a Two-Lane Roadway

GENERAL NOTES

1. Place channelizing devices to form a temporary physical gore until pavement markings are installed.



LEGEND

- □ □ CHANNELIZING DEVICES
- ⋈ SIGN LOCATION

TEMPORARY EXIT GORE  
TCD 15

**TCD 15 – Typical Temporary Exit Gore Channelization Plan**