Traffic Control and Protection Plan
For
Niagara Health System

St. Catharines Hospital Project No. SCS 17-006
Municipal Road and New Parking Lot

Rankin Job# 18-L5

The **Ministry of Transportation Book 7 - Temporary Conditions – Ontario Traffic Manual, January 2014,** and more specifically Table G – Decision Matrix: Typical Layouts on page 193 through 196 of the Manual will be the relevant guide for the Rankin Construction Inc.'s Traffic Protection Plan for this project. The attached schematics will constitute the traffic protection plan configurations that will be used by Rankin Construction Inc. and all subcontractors for the duration of the construction work on this project.

A copy of Temporary Conditions – Field Edition should be kept on site and referred to when proposed typical layouts are not appropriate. It might be necessary to design new typical layout in accordance with sound traffic engineering principles.

This Plan shall be reviewed with al personnel (General and Subcontractors) and the Site Superintendent shall ensure that the Plan is implemented correctly. The Plan shall be reviewed daily when Traffic Control Persons (Flagpersons) are being used on this project.

Type of Work: Road Construction

Short Duration: Stationary Maintenance, construction, or utility activities that require a separate workspace for more than 30 minutes and less than one 24 hour period.

Long Duration: Stationary Maintenance, construction, or utility activities that require a separate workspace for more than 24 hours

Road Configuration: Two-Lane Road – NON Freeway
Multi-Lane Road – NON Freeway

Traffic Protection Plan Configurations Required:

- Table A: Work Zone Component Dimensions: Very Short and Short Duration Work (Non-Freeways)
- Table B: Work Zone Component Dimensions: Long Duration Work

(Non-freeways)
- Figure 1: Component Areas for Temporary Conditions
- TL-01: Designated Construction Zone Signing
- TL-02: Designated Construction Zone Signing
- TL-05: Shoulder Work – Mobile Operation & Very Short Duration
- TL-06: Shoulder Work – Short Duration & Long Duration
- TL-07: Lane Encroachment – Mobile Operation & Very Short Duration
- TL-08: Lane Encroachment – Short Duration & Long Duration
- TL-09: Partial Lane Shift – Short Duration & Long Duration
- TL-14: Lane Encroachment – Short Duration & Long Duration
- TL-17: Partial Lane Shift – Long Duration
- TL-19: Lane Closed – Very Short Duration, Short Duration & Long Duration
- TL-20A: Lane Closed – Very Short Duration & Short Duration
- TL-20B: Lane Closed – Very Short Duration & Short Duration
- TL-20C: Lane Closed – Very Short Duration & Short Duration
- TL-22: Lane Closed or Occupied – Mobile Operations & Very Short Duration
- TL-23: Lane Closed – Short Duration & Long Duration
- TL-25: Left Lane Closed – Mobile Operations & Very Short Duration
- TL-26: Left Lane Closed – Short Duration & Long Duration

NOTE: COPIES OF APPLICABLE CONFIGURATIONS ARE INCLUDED WITH PLAN

Other Site Specific Considerations

(a) Identification of Hazards:
- Workers to be aware of the travelling public and construction traffic at all time.
- A Signal Person is required for Equipment Operators when working around line of sight obstructions and overhead power lines.
- A Signal Person is required to guide Dump Trucks and Concrete Trucks when trucks are reversing.

(b) Traffic Control Measures to be used:
- See section 1 above.

(c) Method of carrying out the set-up and removal of Traffic Control Measures:
- Set up work zone traffic control devices starting upstream end of work zone
- Removal lane closure to be carried out in reverse of Set-up

(d) Protective Clothing to be Worn by All personnel on Site:
- CSA Approved Safety Footwear protection
- CSA Approved Safety Head protection
- CSA Approved Safety Vest with reflective stripping

(e) Workers required for Traffic Control Operations:
- A minimum of two workers shall be used in any Traffic Control Operation. Though we are using RC Flagmen in the event of a failure Stop slow paddles shall be made available on site. If for any reason the visibility shall be

obstructed between the TCP's, two-way radios shall be utilized for proper communication.

(f) Distance a Worker is to remain away from delineators:

- Workers shall remain as far away as possible from Traffic Control Devices.

(g) Construction Traffic Entering and Exiting the Work Zone:

- Workers to be aware of the travelling public and construction traffic at all time.
- A Signal Person is required for Equipment Operators when working around line of sight obstructions and overhead power lines.
- A Signal Person is required for to guide Dump Trucks and Concrete Trucks when trucks are reversing.

(h) Inspection of Traffic Control Devices:

- The Supervisor, or an appointed alternate, shall inspect the Traffic Control Devices at a minimum frequency of twice daily.
- Once the Traffic Alteration is in place the Supervisor, or an appointed alternate, shall travel through the alteration with the Travelling Public to ensure that the Traffic Control Devices are adequate to provide safe passage for all vehicles.

(i) Traffic Flows with Regards to Work Schedule

- Traffic delays will be kept to a minimum with the use of typical layout for this scenario according to Ministry of Transportation – Temporary Conditions Manual

(j) Safety Procedure Working Near Hydro Lines

- When working near hydro lines a competent working will signal the operator to ensure that no object shall be brought closer to an energized overhead electrical conductor with a nominal phase-to-phase voltage rating set out in the table below:

Column 1 Nominal phase-to-phase voltage rating	Column 2 Minimum distance
750 to 150,000 volts	3 metres
150,000 to 250,000 volts	4.5 metres
more than 250,000 volts	6 metres

O. Reg. 627/05, s. 7.

- The equipment boom shall be at 90 degrees to the wires so that if the boom control was to fail (which could cause the boom to come down unexpectedly) the boom would fall be away from the wires.
- Swing the load away from the wires.
- Place "Danger to" signs in the area of the hydro wire hazard to warn about the danger of overhead wires.
- Place a sticker in cab to remind operator of the danger of overhead wires.
- Operate the equipment at a slower-than-normal rate in the vicinity of power lines.

- Exercise caution near long spans of overhead power lines, since wind can cause the power lines to sway laterally and reduce the clearance between the equipment and the power line.
- Exercise caution when traveling over uneven ground that could cause the equipment to weave or bob into power lines.
- Keep all personnel well away from the equipment whenever it is close to power lines.
- Prohibit persons from touching the equipment or its load until a signal person indicates that it is safe to do so.

**** When working near wires, conduct a daily tail gate safety meeting to review these procedures**.

(k) Procedures to Follow If Contact Occurs

To protect against electrical shock injury in the event of contact between equipment and an energized line, the CSA recommends the following:

- The equipment operator should remain inside the cab.
- All other personnel should keep away from the equipment and load, since the ground around the machine might be energized.
- The equipment operator should try to remove the machine from contact by moving it in the reverse direction from that which caused the contact.
- If the equipment cannot be moved away from contact, the operator should remain inside cab until the lines have been de-energized.

Table A Work Zone Component Dimensions: Very Short and Short Duration Work (Non-freeways)

		Normal Posted Regulatory Speed Limit **				
	Dimension	50 km/h or lower	60 km/h	70 km/h	80 km/h	90 km/h
1a*	Taper length for full lane closure (m)	10 – 15	20 – 30	30 – 40	50 – 60	70 – 80
1b*	Taper length for roadside work (m) ***	3 – 5	5 – 7	7 – 10	10 – 12	15 – 20
2*	Longitudinal buffer area (LBA) (m)****	(30)	(40)	50	60	75
3*	Maximum distance between markers (m)*****	4 – 6	4 – 6	8 – 10	8 – 10	10 – 12
	Minimum number of markers for taper	at least 4 markers	at least 5 markers	at least 5 markers	at least 7 markers	at least 8 markers
4*	Minimum tangent between tapers (m)	30	30	60	60	80
5*	Distance between construction signs (m) ******	20 – 30	20 – 30	50 – 60	50 – 60	70 – 80

** Table A distances are based on good visibility, and should be increased if visibility is poor.*

*** The regulatory maximum speed posted on a highway applies under normal conditions; that is, when no construction zone or work activity is present. Guideline provisions required in OTM Book 7 are based on normal posted regulatory speed, and not on temporarily reduced construction zone regulatory or advisory speeds.*

**** Roadside work includes shoulder work and roadway edge work.*

***** LBAs are optional at speeds of 60 km/h or lower, but should be used for closed lanes on multi-lane roads if space permits.*

****** Markers are channelizing devices. Application guidelines are shown in Table F. Cones with reflective collars may be used for daytime or night-time operations on non-freeways.*

******* 5* also refers to the required distance for the placement of a TC Warning Sign ahead of the hazard where referenced in section 6.3.5 for the individual signs.*

Table B Work Zone Component Dimensions: Long Duration Work (Non-freeways)

		Normal Posted Regulatory Speed Limit**				
	Dimension	50 km/h or lower	60 km/h	70 km/h	80 km/h	90 km/h
1a*	Taper length for full lane closure (m)	LV: 15 – 25 HV: 30 – 50	40 – 60	60 – 80	100 – 120	140 – 160
1b*	Taper length for roadside work (m)***	LV: 5 – 8 HV: 9 – 15	10 – 15	15 – 20	20 – 25	30 – 40
2*	Longitudinal buffer area (LBA) (m)****	(30)	(40)	50	60	75
3*	Maximum distance between markers (m)*****	6 – 8	8 – 10	8 – 10	10 – 12	12 – 14
	Minimum number of markers for taper	at least 5 markers	at least 7 markers	at least 9 markers	at least 11 markers	at least 13 markers
4*	Minimum tangent between tapers (m)	55	100	120	140	160
5*	Distance between construction signs (m) ******	40 – 50	90 – 100	110 – 120	130 – 140	150

** Table B distances are based on good visibility, and should be increased if visibility is poor.*

*** The regulatory maximum speed posted on a highway applies under normal conditions, that is, when no construction zone or work activity is present. Guideline provisions required in OTM Book 7 are based on normal posted regulatory speed, and not on temporarily reduced construction zone regulatory or advisory speeds.*

**** Roadside work includes shoulder work and roadway edge work.*

***** LBAs are not a requirement at speeds of 60 km/h or lower, but should be used for closed lanes on multi-lane roads if space permits.*

****** Markers are channelizing devices. Application guidelines are shown in Table F. Cones with reflective collars may be used for daytime or night-time operations on non-freeways.*

******* 5* also refers to the required distance for the placement of a TC Warning Sign ahead of the hazard where referenced in section 6.3.5 for the individual signs.*

LV = Low Volume
HV = High Volume
LV is defined as the average daily traffic volume with less than 3000 vehicles per day (combined traffic for both directions). This figure can be obtained from the local road authority or estimated by counting the number of vehicles that pass the work site in 3 minutes and multiplying this figure by 300. The count may be taken in off-peak or peak traffic periods, corresponding to the period during which the work operations will be carried out.
Example: 20 cars in 3 minutes x 300 = 6000 vehicles per day (this would be an HV road).

Table C Work Zone Component Dimensions: Freeways

		Normal Posted Regulatory Speed Limit**		
*	**Dimension**	**80 km/h**	**90 km/h**	**100 km/h**
1a*	Taper length for full lane closure (m)	220	250	300
1b*	Taper length for roadside work (m)***	20 - 25	30 – 40	40 – 50
2*	Longitudinal buffer area (LBA) (m)****	60	75	95
3*	Maximum distance between markers (m)*****	10 - 14	18 – 24	18 – 24
4*	Minimum tangent between tapers (m)	220	250	300
5*	Distance between construction signs (m) ******	160	180	200

** Table C distances are based on good visibility, and should be increased if visibility is poor.*

*** The regulatory maximum speed posted on a highway applies under normal conditions, that is, when no construction zone or work activity is present. Guideline provisions required in OTM Book 7 are based on normal posted regulatory speed, and not on temporarily reduced construction zone regulatory or advisory speeds.*

**** Roadside work includes shoulder work and roadway edge work.*

***** For application of LBA and LIDG, see Table D and Sections 3 and 4.*

****** Markers are channelizing devices. Application guidelines are shown in Table F. Cones with reflective collars may be used for daytime VSD or SD operations only. Construction markers or flexible drums must be used for all other conditions.*

******* 5* also refers to the required distance for the placement of a TC Warning Sign ahead of the hazard where referenced in section 6.3.5 for the individual signs.*

Table D Application of Longitudinal Buffer Area and Lateral Intrusion Deterrence Gap

Stationary Work Operations		
Required Protection (Freeways): LBA + Buffer Vehicle + LIDG Required Protection (Non-freeways): LBA only		
(1) Normal Posted Regulatory Speed Limit (km/h)	**(2) Longitudinal Buffer Area (LBA) (m)**	**(3) Lateral Intrusion Deterrence Gap (LIDG) (m)**
50	(30)*	(35)*
60	(40)*	(40)*
70	50	50
80	60	60
90	75	65
100	95	70

Mobile Work Operations	
(1) Normal Posted Regulatory Speed Limit (km/h)	(2) Lateral Intrusion Deterrence Gap (LIDG) (m)
70	35
80	45
90	50
100	55

**LBA and LIDG are optional for normal posted regulatory speed of 50 km/h and 60 km/h.*

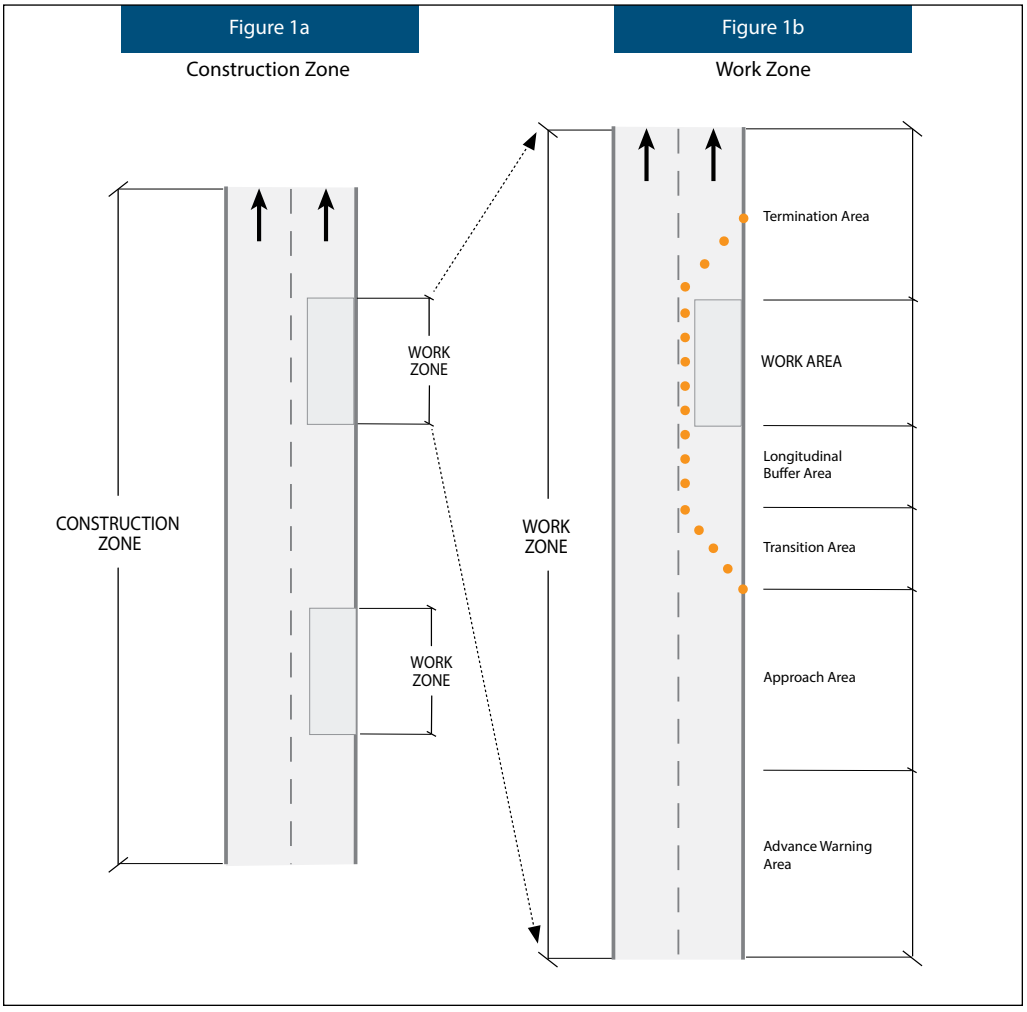
1. See also Section 3 and Section 4.

NOTE

2.4 Component Areas for Temporary Conditions

A ***construction zone*** encompasses the full length of a project (see Figure 1 Component Areas). Within a construction zone, there may be one or multiple work zones. The road authority may also legally establish a designated construction zone which will result in doubled speed fines within the designated construction zone when workers are present. See TL-1, TL-2 & Section 2.6 for designated construction zone signage.

Figure 1 Component Areas



A ***work zone*** is an area where traffic control devices have been set up to provide positive guidance to road users through a temporary situation. It includes the entire section from the first advance warning sign through to the last traffic control device, where traffic returns to its normal path and conditions. A work

zone can be in any of the configurations described in Section 2.3 and may be stationary or mobile. The amount of street space used by a work zone should be no more than is absolutely necessary.

A well-designed work zone normally contains six distinct component areas, in the following sequence:

- advance warning area;
- approach area;
- transition area;
- longitudinal buffer area;
- work area(s); and
- termination area.

These six component areas are described below in the order that drivers encounter them.

NOTE

A well-designed work zone normally contains six distinct component areas.

2.4.1 Advance Warning Area

The advance warning area lengths are used to alert road users of road work ahead. The required distances for the placement of advance signs, shown in Section 8 (Typical Layouts), must be adhered to as closely as practicable.

The advance warning area may need to be increased to accommodate obstacles such as interchanges, bridges, and sightline restrictions. The advance warning area should be actively monitored. If queues are generated that extend beyond the advance warning signs then additional traffic control devices should be set up in advance of the observed end of a queue.

2.4.2 Approach Area

The approach area is used to inform road users of actions that are required or prohibited. The road users are informed of lane changes, speed reductions, passing restrictions, and the like. Road users will require the information at a sufficient distance in advance in order to be able to adjust to an altered situation before reaching it. The devices may vary from a single sign or flashing lights to a series of signs in advance of the transition area.

NOTE

The required distances for the placement of devices in the approach area, shown in Section 8 (Typical Layouts), must be adhered to as closely as practicable.

2.4.3 Transition Area

In the transition area, traffic is channelled from the normal path to a new path required to move traffic past the work area. Work material, vehicles, and equipment must not be stored or parked in the transition area.

The transition area must be obvious to road users.

The transition area must be delineated by channelizing devices, unless otherwise indicated in the typical layouts. It contains the tapers and parallel sections (if more than one lane closed) that are used to effectively close the lanes. The length of the tapers and the parallel sections are extremely important. Guidelines for taper and parallel section lengths are outlined in Tables A, B, and C used in conjunction with typical layouts (see Section 8). If visibility is limited by a horizontal or vertical curve, a taper might need to be lengthened (beyond the length shown in typical layouts) so as to give drivers adequate warning and visibility of the start of the taper.

Note: The parallel sections referred to here are the lengths between successive tapers, and are not the same as the longitudinal buffer area (LBA) described below.

The transition area must be obvious to road users. The intended travel path must be clearly delineated so that road users will not mistakenly follow the wrong path. For long duration operations, there may be the requirement to remove or mask out existing pavement markings and possibly enhance the transition area with temporary pavement markings to identify a clear route where there could be confusion about the proper path.

2.4.4 Longitudinal Buffer Area (LBA)

In work zones, the LBA provides protection for traffic and workers, by providing an opportunity for road users to brake to a halt between the end of the transition area and the work area or Buffer Vehicle (BV) .

No traffic control devices, work material, vehicles, or equipment should be stored or parked in an LBA.

When a LBA with a BV is used, the appropriate distance to use in front (downstream) of the BV is called the Lateral Deterrence Intrusion Gap (LIDG). It is used in combination with the taper, LBA, and BV. (see Section 5.5)

An LBA is recommended in all situations where practicable, and may even be used in circumstances which are not indicated in the typical layouts. As a guideline, an LBA is not required:

- for partial lane shifts, provided lane widths of at least 3.0 m are maintained;
- for non-freeway shoulder operations;
- where traffic is controlled by means of TCPs, automated flagger assistance devices (remote control devices), portable lane control signals (PLCS), or portable temporary traffic signals (PTTS); or
- in urban areas where normal posted speeds are 60 km/h or lower. In urban areas, drivers face more stimuli, including traffic signals, and drivers are less likely to be drowsy or inattentive. The other traffic control devices in the work zone should be sufficient to alert the drivers of the work area ahead, without requiring an LBA. The LBA lengths are included in Tables A, B, C and D and illustrated on the typical layouts, where applicable.

NOTE

No traffic control devices, work material, vehicles, or equipment should be stored or parked in an LBA.

2.4.5 Work Area

The work area is where the work takes place and/or equipment and material are stored. It is still considered a work area when work is temporarily stopped yet the road has not returned to its normal operation conditions. A work area may or may not contain a work vehicle.

The work area may be in a fixed location or move as work progresses. There may be more than one work area within a work zone. Every practical effort should be made to minimize hazards and distractions to drivers and workers. See the requirements of Regulation 213/91 under the OHSA.

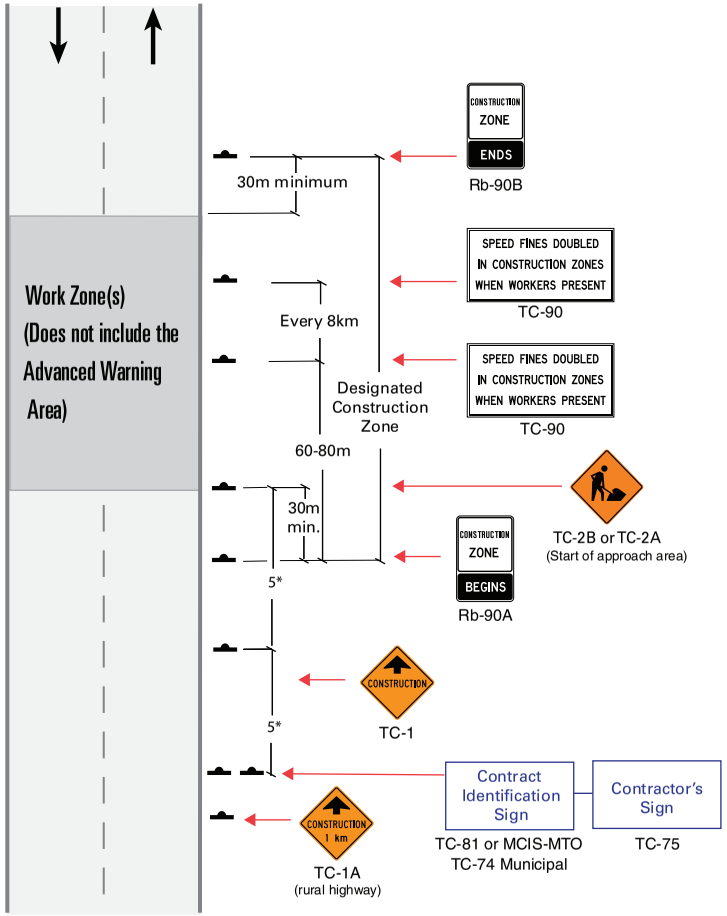
2.4.6 Termination Area

The termination area is used for traffic to make the transition back to the normal path of a road. The termination area extends from the downstream end of the work area to the point where traffic is able to resume normal driving, typically at the end of the delineation of the termination taper on multi-lane divided roadways or at the TC-2 in the opposing direction of an undivided roadway.

Figure TL-1 Designated Construction Zone Signing

☑ Two-Lane
☐ Multi-Lane
☐ Undivided Non-freeway
☐ Divided Non-freeway
☐ Freeway

☐ Mobile Operations
☐ Very Short Duration
☐ Short Duration
☑ Long Duration



* See *Table B*.

NOTES

i) The same signing is required in the opposite direction.

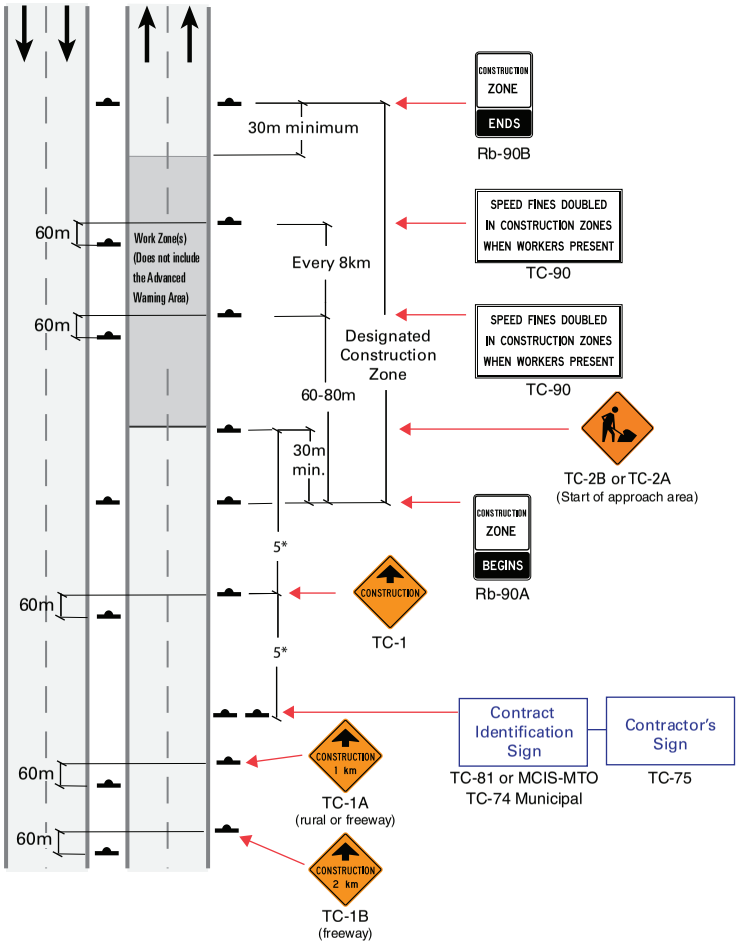
ii) Speed Fines Doubled signs are recommended, but not required.

iii) As shown, the limits of the Designated Construction Zone do not need to include TC-1, TC-1A, TC-1B, TC-5, TC-5A, TC-5B and information signs.

Figure TL-2 Designated Construction Zone Signing

☐ Two-Lane
☑ Multi-Lane
☑ Undivided Non-freeway
☑ Divided Non-freeway
☑ Freeway

☐ Mobile Operations
☐ Very Short Duration
☐ Short Duration
☑ Long Duration



* For Non-Freeways, see *Table B*. For Freeways, see *Table C*.

NOTES

i) Where signs cannot be accommodated in the median, provide additional signs on the right shoulder or oversize as practicable.

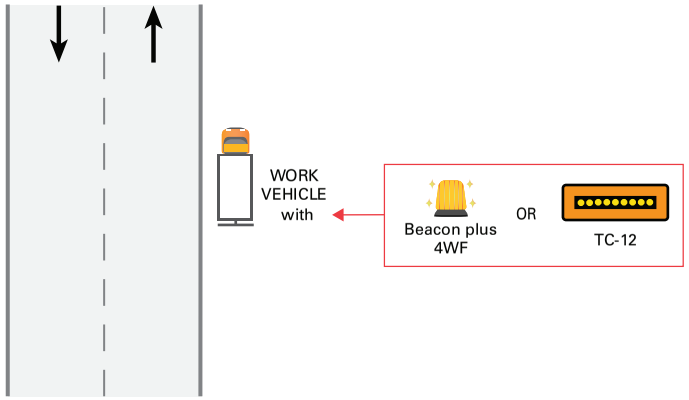
ii) Speed Fines Doubled signs are recommended, but not required.

iii) As shown, the limits of the Designated Construction Zone do not need to include TC-1, TC-1A, TC-1B, TC-5, TC-5A, TC-5B and information signs.

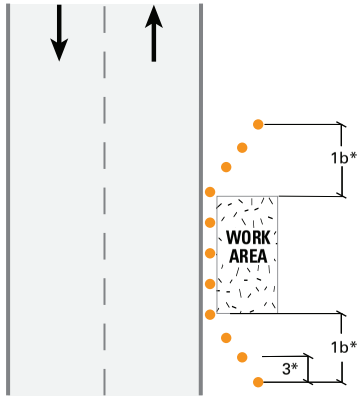
Figure TL-5 Shoulder Work

- ☑ Two-Lane
- ☑ Multi-Lane
- ☑ Undivided Non-freeway
- ☑ Divided Non-freeway
- ☐ Freeway
- ☑ Mobile Operations
- ☑ Very Short Duration
- ☐ Short Duration
- ☐ Long Duration

With work vehicle - Mobile or VSD



No work vehicle - VSD



* See *Table A*.

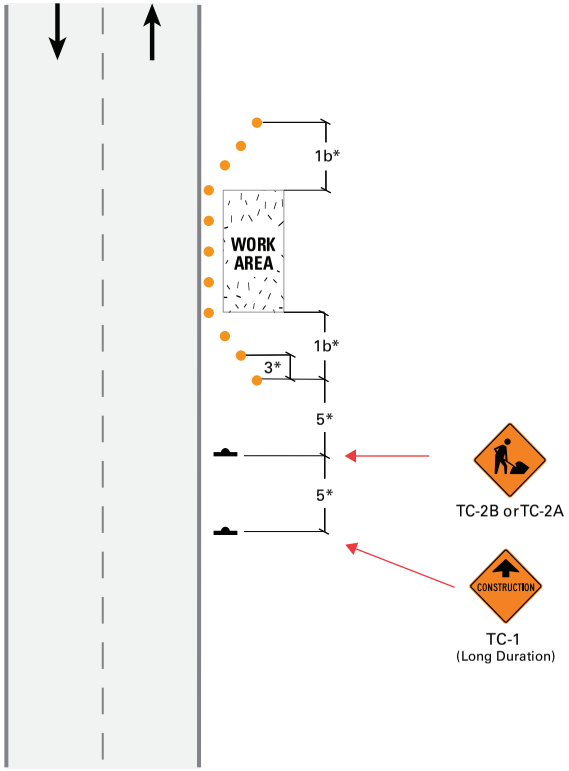
NOTES

i) Work on the left shoulder mirror image for multi-lane divided road.

ii) Termination taper optional.

Figure TL-6 Shoulder Work

- ☑ Two-Lane
- ☑ Multi-Lane
- ☑ Undivided Non-freeway
- ☑ Divided Non-freeway
- ☐ Freeway
- ☐ Mobile Operations
- ☐ Very Short Duration
- ☑ Short Duration
- ☑ Long Duration



* For Short Duration, see *Table A*. For Long Duration, see *Table B*.

NOTES

i) Work on the left shoulder mirror image for multi-lane divided road.

ii) Termination taper optional.

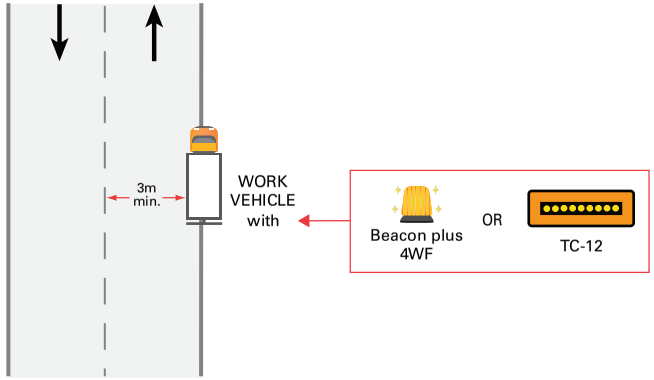
iii) Work area may or may not contain a work vehicle. See General Notes to Typical Layouts #4.

iv) A work vehicle with a TC-12 may replace cones for Short Duration work.

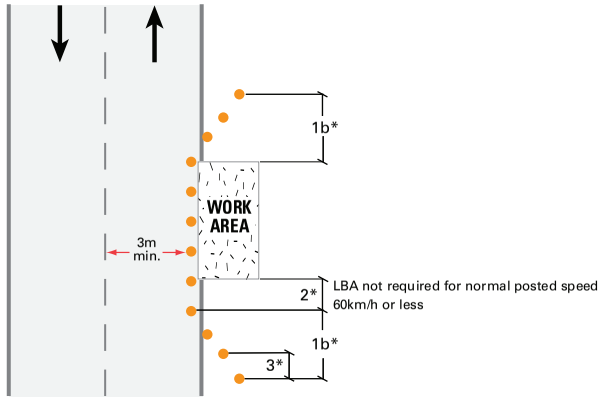
Figure TL-7 Lane Encroachment

- ☑ Two-Lane
- ☑ Multi-Lane
  - ☑ Undivided Non-freeway
  - ☑ Divided Non-freeway
  - ☐ Freeway
- ☑ Mobile Operations
- ☑ Very Short Duration
- ☐ Short Duration
- ☐ Long Duration

With work vehicle - Mobile or VSD



No work vehicle - VSD



* See *Table A*.

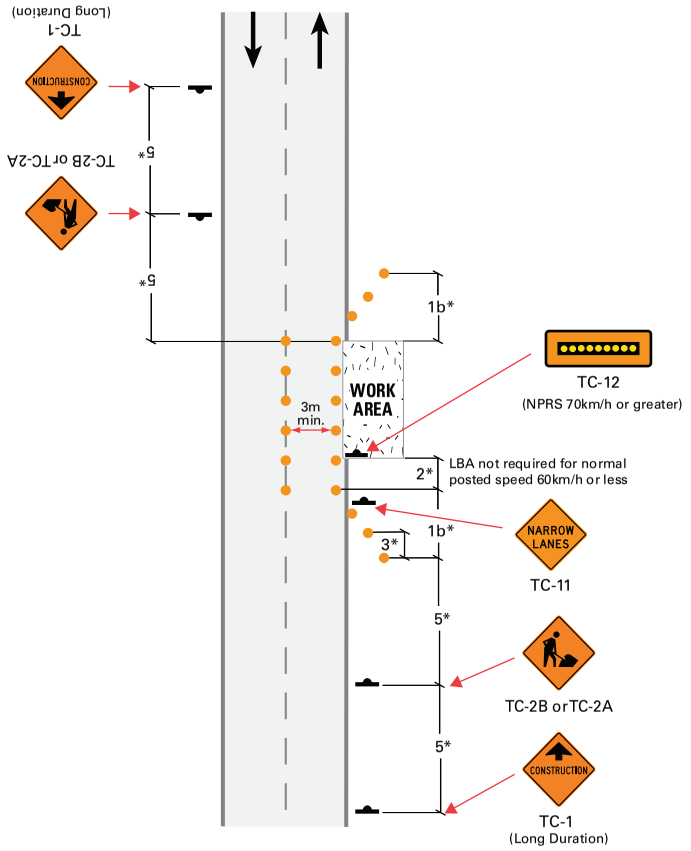
NOTES

i) Termination taper optional.

ii) Encroachment in the left lane, mirror image for multi-lane divided road.

Figure TL-8 Lane Encroachment

- ☑ Two-Lane
- ☐ Multi-Lane
  - ☐ Undivided Non-freeway
  - ☐ Divided Non-freeway
  - ☐ Freeway
- ☐ Mobile Operations
- ☐ Very Short Duration
- ☑ Short Duration
- ☑ Long Duration



* For Short Duration, see *Table A*. For Long Duration, see *Table B*.

NOTES

i) If Available Lane Width (ALW) is less than 3m, use partial lane shift (See TL-9, TL-10) or lane closures (TL-20A, TL-20B, TL-21).

ii) Center line cones are optional and are to be used if lane keeping is an issue.

iii) On unpaved roads with low volume (<3000 vehicles per day):
- Where remaining roadway width is at least 6m, and ALW is less than 3m, use Rb-91, a distance 5* upstream of start of taper, and move the TC-1 and TC-2B an additional distance 5* upstream.

iv) Work area may or may not contain a work vehicle. See General Notes to Typical Layouts #4.

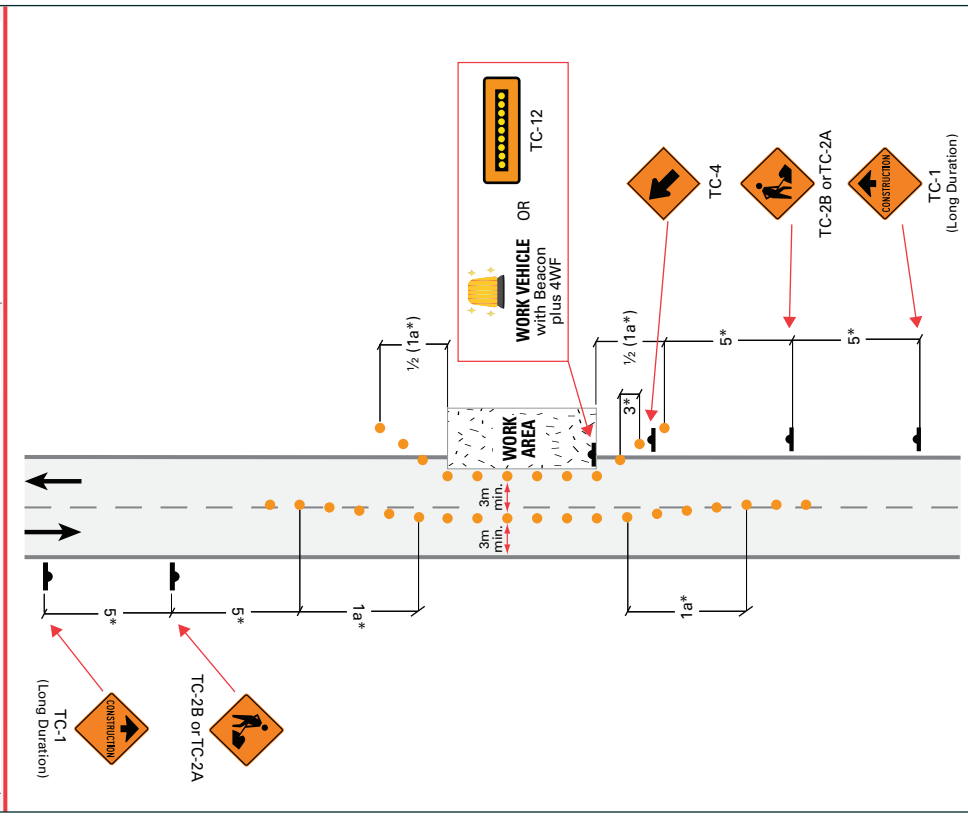
v) A work vehicle with a TC-12 may replace cones for Short Duration work where NPRS is under 70km/h.

Figure TL-9 **Partial Lane Shift**

☑ Two-Lane ☐ Multi-Lane

☐ Undivided Non-freeway ☐ Divided Non-freeway ☐ Freeway

☐ Mobile Operations ☐ Very Short Duration ☑ Short Duration ☑ Long Duration



NOTES

* For Short Duration, see *Table A*. For Long Duration, see *Table B*.

i) Remaining roadway must be at least 6m with a lane width of at least 3m in each direction.

ii) Traffic should not be shifted onto a surface texture different from the main roadway without a posted speed reduction.

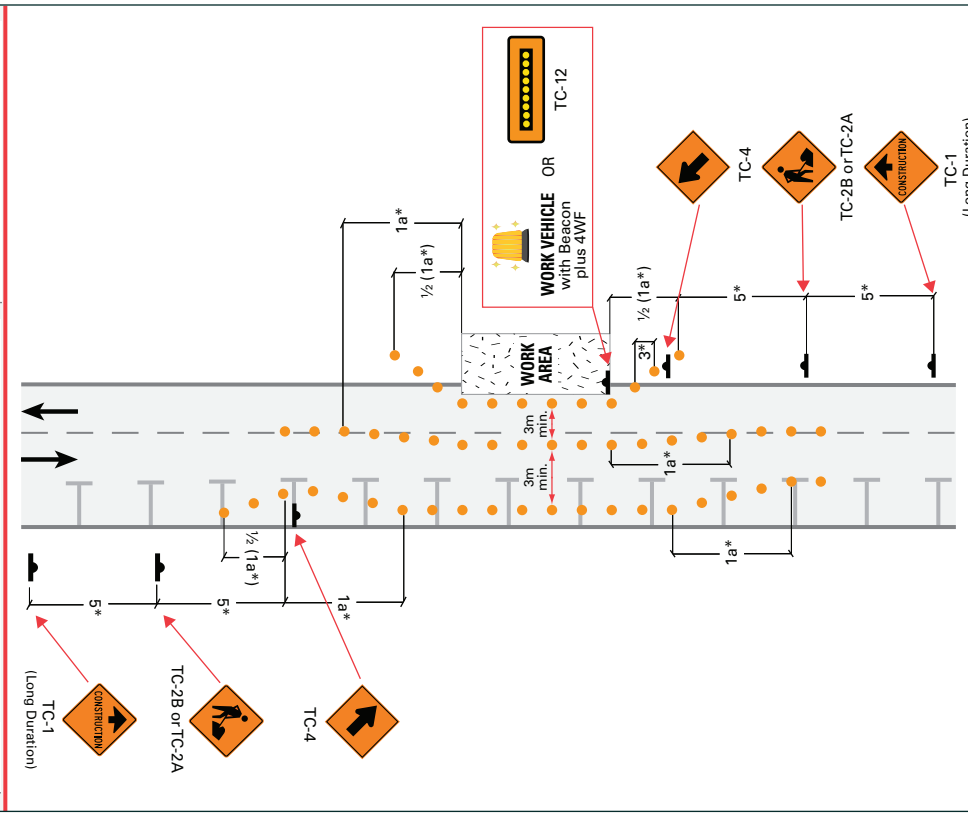
iii) For Work Areas 50m or less.

Figure TL-10 **Partial Lane Shift: Wide Platform**

☑ Two-Lane ☐ Multi-Lane

☐ Undivided Non-freeway ☐ Divided Non-freeway ☐ Freeway

☐ Mobile Operations ☐ Very Short Duration ☑ Short Duration ☑ Long Duration



NOTES

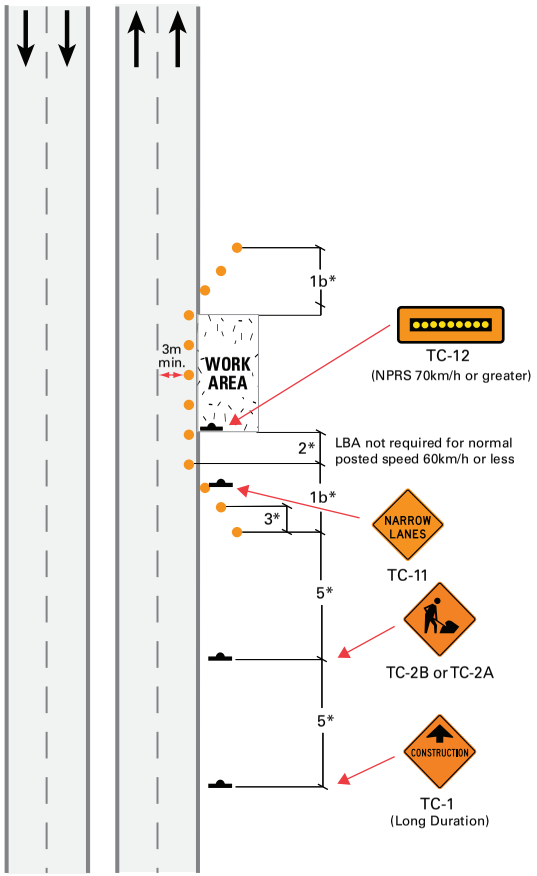
* For Short Duration, see *Table A*. For Long Duration, see *Table B*.

i) Remaining roadway must be at least 6m with a lane width of at least 3m in each direction.

ii) Traffic should not be shifted onto a surface texture different from the main roadway without a posted speed reduction.

Figure TL-14 Lane Encroachment

- ☐ Two-Lane
- ☑ **Multi-Lane**
  - ☑ **Undivided Non-freeway**
  - ☑ **Divided Non-freeway**
  - ☐ Freeway
- ☐ Mobile Operations
- ☐ Very Short Duration
- ☑ **Short Duration**
- ☑ **Long Duration**



* For Short Duration, see *Table A*. For Long Duration, see *Table B*.

NOTES

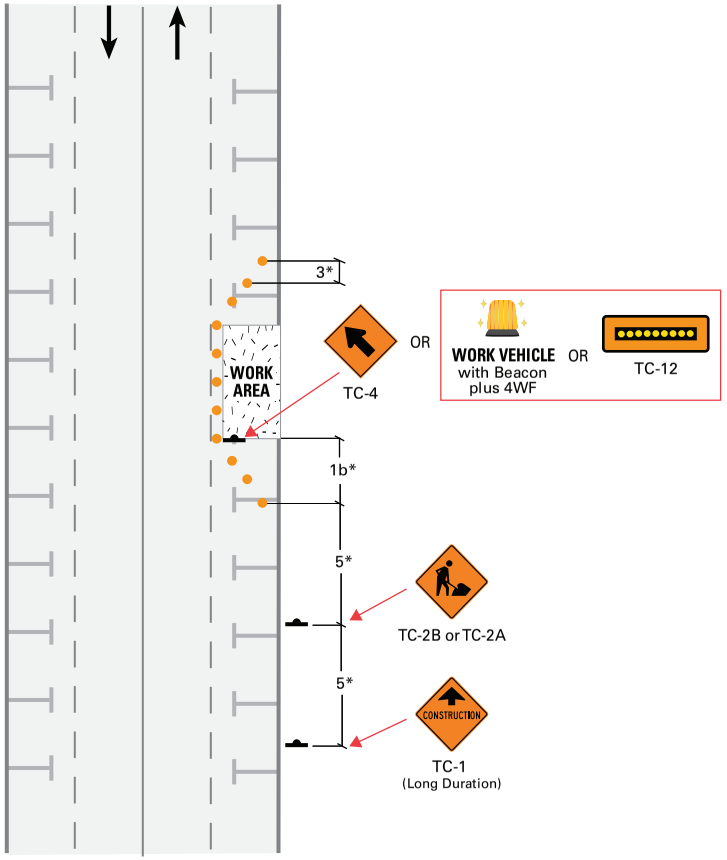
i) Encroachment in the left lane: mirror image of right lane (divided roads only).

ii) Work area may or may not contain a work vehicle. See General Notes to Typical Layouts #4.

iii) A work vehicle with a TC-12 may replace cones for Short Duration work where NPRS is under 70km/h.

Figure TL-16 Parking Lane Closed

- ☐ Two-Lane
- ☑ **Multi-Lane**
  - ☑ **Undivided Non-freeway**
  - ☑ **Divided Non-freeway**
  - ☐ Freeway
- ☐ Mobile Operations
- ☑ **Very Short Duration**
- ☑ **Short Duration**
- ☑ **Long Duration**



* For Very Short and Short Duration, see *Table A*. For Long Duration, see *Table B*.

NOTES

i) Placement of TC-1 or TC-2 may need to be adjusted if visibility is obstructed due to parked vehicles.

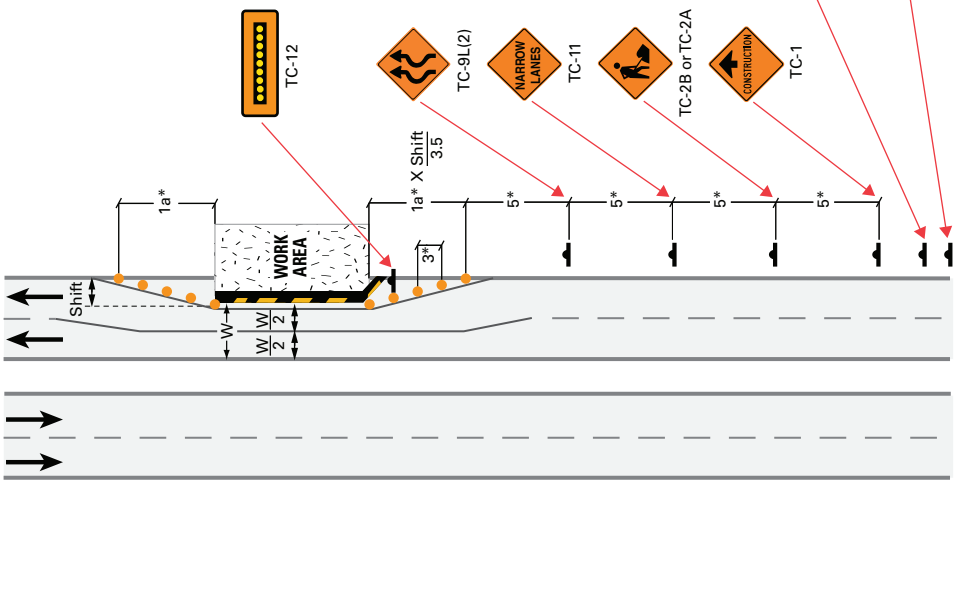
ii) For very short or short duration work, a work vehicle with Beacon/4WF or a TC-12 in bar mode can replace cones.

Figure TL-17 **Partial Lane Shift: Narrow Lanes**

☐ Two-Lane
☑ **Multi-Lane**

☑ **Undivided Non-freeway**
☑ **Divided Non-freeway**
☑ **Freeway**

☐ Mobile Operations
☐ Very Short Duration
☐ Short Duration
☑ **Long Duration**



NOTES

* For Non-Freeways, see *Table B*. For Freeways, see *Table C*.

i) $\frac{W}{2}$ = 3m minimum (3.5m preferred on Freeways).

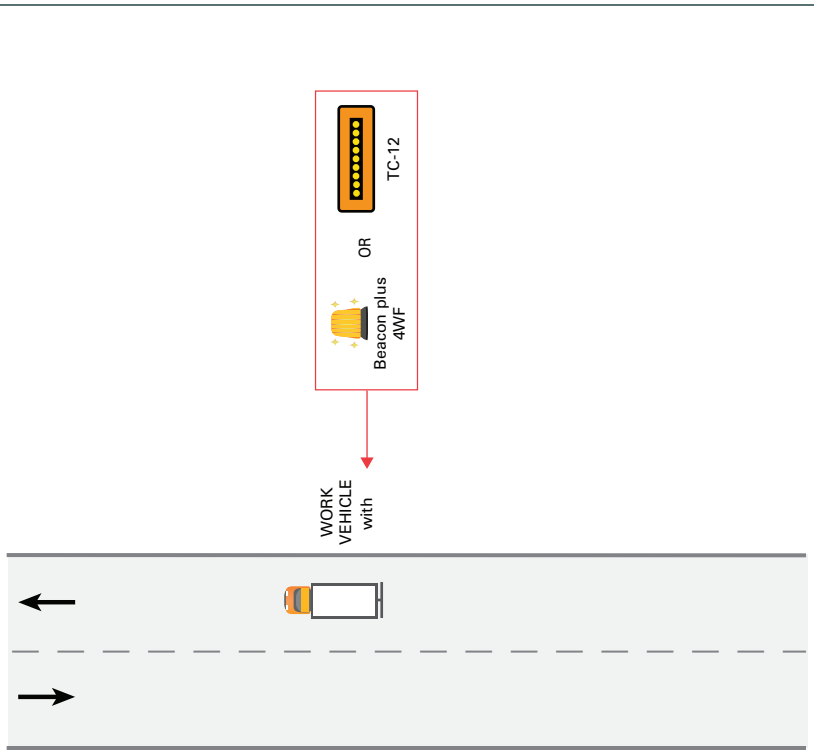
ii) For narrowed lanes exceeding 2 km, use a TC-16EL (ER) in place of the TC-9L(R). Add an additional TC16ER(EL) at the beginning of end taper.

Figure TL-18 **Lane Closed or Occupied**

☑ **Two-Lane**
☐ Multi-Lane

☐ Undivided Non-freeway
☐ Divided Non-freeway
☐ Freeway

☑ **Mobile Operations**
☐ Very Short Duration
☐ Short Duration
☐ Long Duration



NOTES

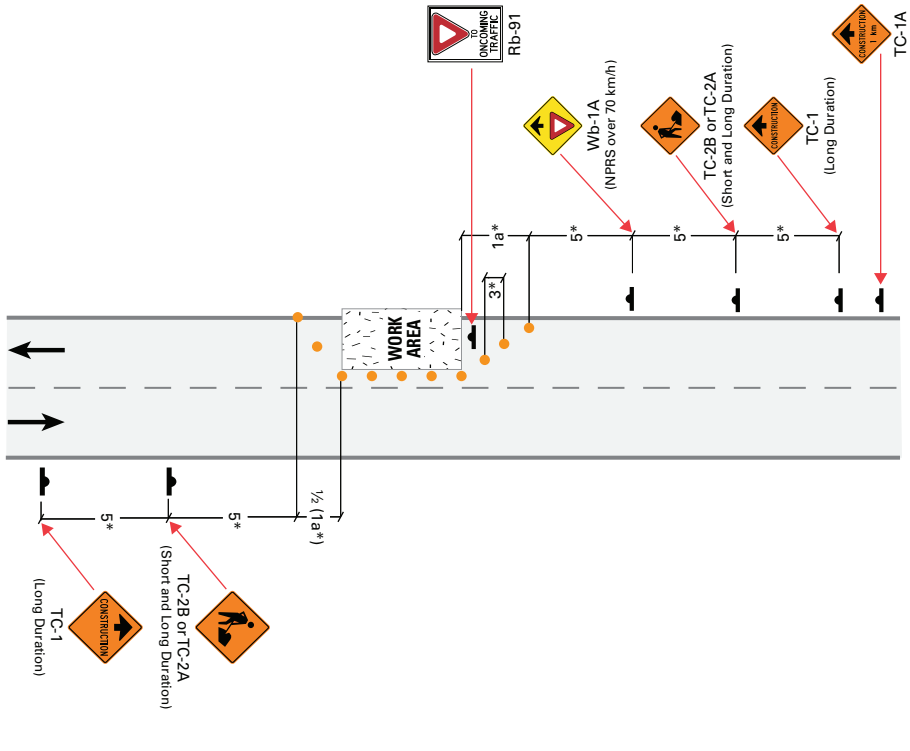
* See *Table A*.

Figure TL-19 **Lane Closed** (Yield to Oncoming Traffic) Low Volume Roads

☑ Two-Lane ☐ Multi-Lane

☐ Undivided Non-freeway ☐ Divided Non-freeway ☐ Freeway

☐ Mobile Operations ☑ Very Short Duration ☑ Short Duration ☑ Long Duration



NOTES

* For Very Short and Short Duration, see *Table A*. For Long Duration, see *Table B*.

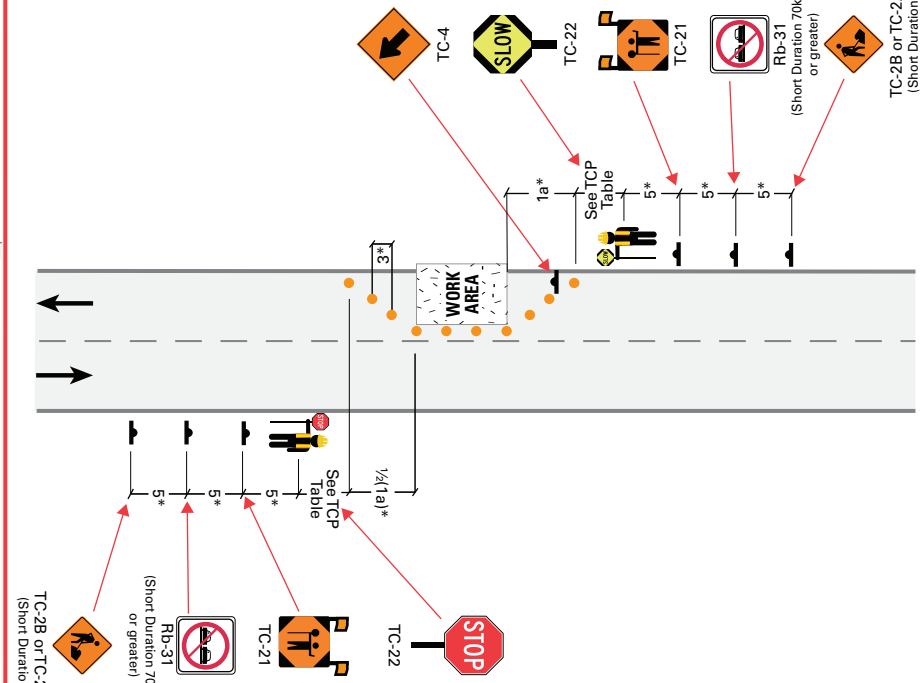
i) Use only on roads with low traffic volume (< 3000 vehicles per day).
ii) To be used for short length work areas (< 150m).
iii) May also be used on roads with no centreline.
iv) Use only where there is unobstructed visibility of oncoming traffic in both directions.
v) Work area may or may not contain a work vehicle. See General Notes to Typical Layouts #4. If work vehicle has a TC-12, it must be in bar mode.

Figure TL-20A **Lane Closed** (Traffic Control Persons)

☑ Two-Lane ☐ Multi-Lane

☐ Undivided Non-freeway ☐ Divided Non-freeway ☐ Freeway

☐ Mobile Operations ☑ Very Short Duration ☑ Short Duration ☐ Long Duration



NOTES

* See *Table A*.

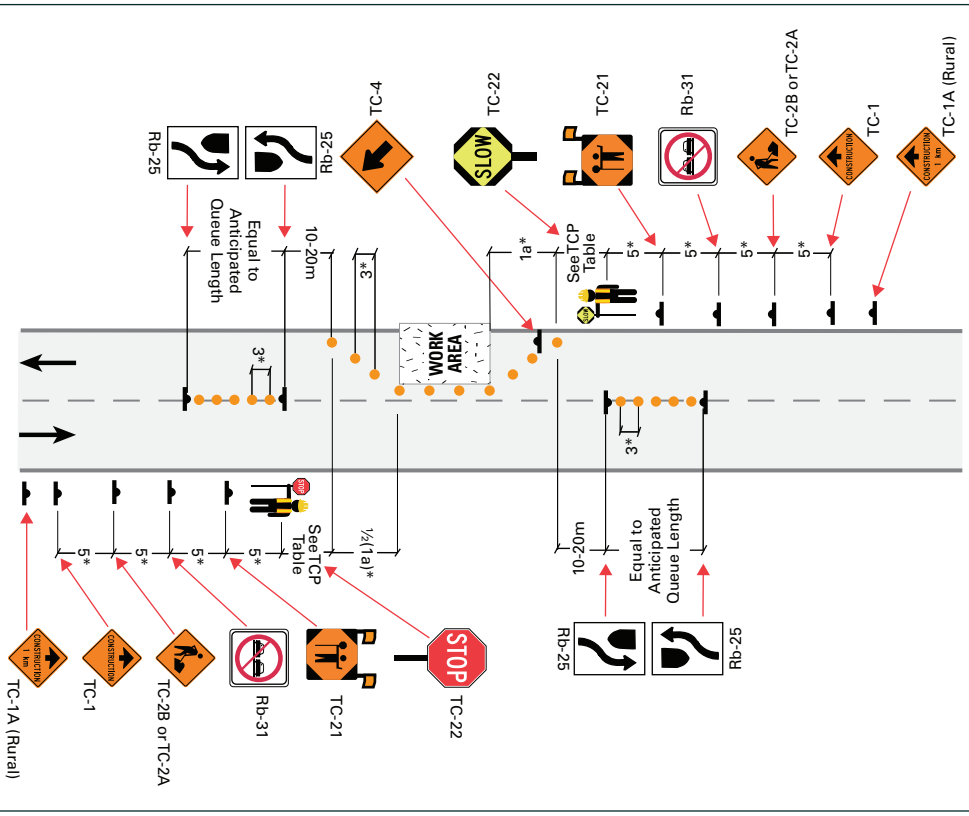
i) For low-volume roads (< 3000 vehicles per day) and visibility more than 150m beyond the end taper, the TCP and TC-21 may be eliminated for the direction that is not closed.
ii) For Very Short duration, work on low-volume roads with a normal posted speed less than 70km/h, the cones are not required.
iii) On high speed (70 km/h or greater) or where lane keeping/compliance is an issue, consider using TL-20B.

Figure TL-20B **Lane Closed (Traffic Control Persons)**

☑ Two-Lane ☐ Multi-Lane

☐ Undivided Non-freeway ☐ Divided Non-freeway ☐ Freeway

☐ Mobile Operations ☐ Very Short Duration ☐ Short Duration ☑ Long Duration



NOTES

* See *Table B*.

i) For low-volume roads (< 3000 vehicles per day) and visibility more than 150m beyond the end taper, the TCP and TC-21 may be eliminated for the direction that is not closed.

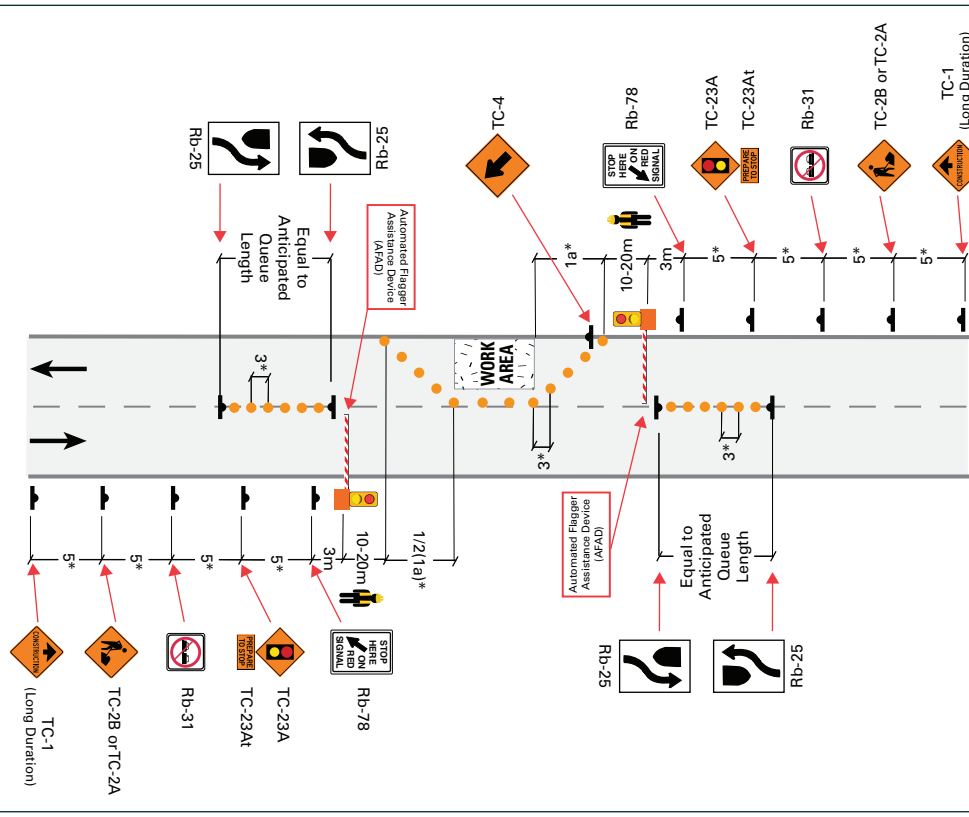
ii) Centreline cones between RB-25 signs and RB-25 signs are optional and may be used in one or both directions if lane keeping becomes an issue.

Figure TL-20C **Lane Closed (Automated Flagger Assistance Device)**

☑ Two-Lane ☐ Multi-Lane

☐ Undivided Non-freeway ☐ Divided Non-freeway ☐ Freeway

☐ Mobile Operations ☐ Very Short Duration ☑ Short Duration ☑ Long Duration



NOTES

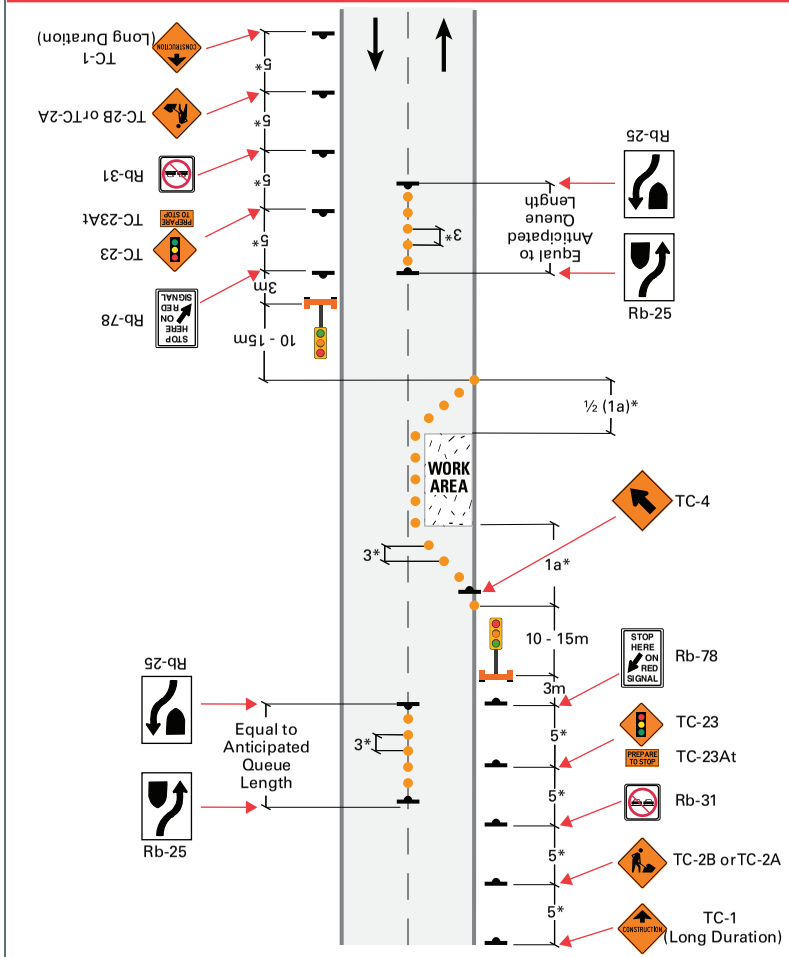
* For Short Duration, see *Table A*; For Long Duration, see *Table B*.

i) TCP is required to control Automated Flagger Assistance Device and to have a paddle (TC-22) available in the event of failure.

Figure TL-21 Lane Closed (Portable Lane Control Signals)

- ☑ **Two-Lane**
- ☐ Multi-Lane
  - ☐ Undivided Non-freeway
  - ☐ Divided Non-freeway
  - ☐ Freeway

- ☐ Mobile Operations
- ☐ Very Short Duration
- ☑ **Short Duration**
- ☐ Long Duration



* See *Table A*.

NOTES

i) To determine the appropriate timing of the lane control signals, see Section 5.3.2 (Office Edition).

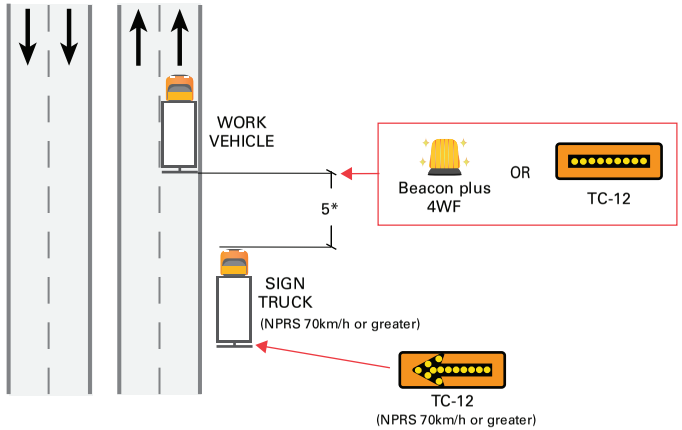
ii) Lane control signals are only to be used while the contractor is on site and on roads with NPRS of 60km/h or less. Portable signals that are to operate when no contractor is present or on roads with a NPRS of 70km/h or greater are Portable Temporary Traffic Control signals (PTTS) and require Road Authority approval of layout and signal timing. MTO applications require the completion of a PHM-125 (see OTM Book 12).

Figure TL-22 Lane Closed or Occupied

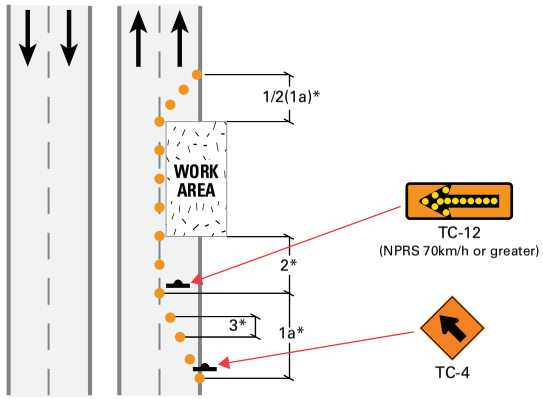
- ☐ Two-Lane
- ☑ **Multi-Lane**
  - ☑ **Undivided Non-freeway**
  - ☑ **Divided Non-freeway**
  - ☐ Freeway

- ☑ **Mobile Operations**
- ☑ **Very Short Duration**
- ☐ Short Duration
- ☐ Long Duration

With work vehicle - Mobile or VSD



No work vehicle - VSD



* See *Table A*.

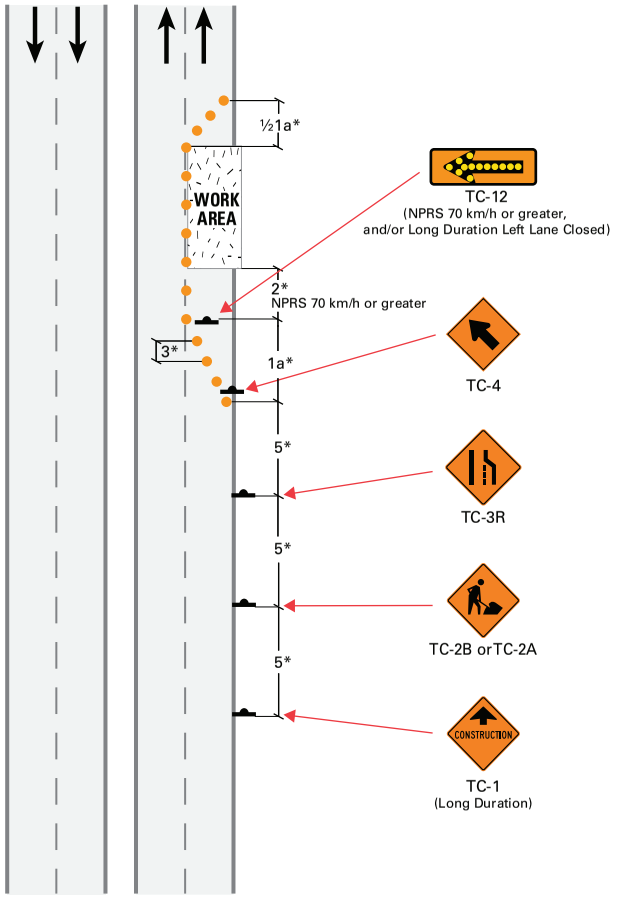
NOTES

i) Distance between sign truck and work vehicle may be adjusted to accommodate hills, curves, restricted visibility, or other site specific conditions.

ii) Left lane closed mirror image on divided roads only. Undivided or no shoulder see TL-25.

Figure TL-23 Lane Closed

- ☐ Two-Lane
- ☑ **Multi-Lane**
  - ☑ **Undivided Non-freeway**
  - ☑ **Divided Non-freeway**
  - ☐ Freeway
- ☐ Mobile Operations
- ☐ Very Short Duration
- ☑ **Short Duration**
- ☑ **Long Duration**



* For Short Duration, see *Table A*. For Long Duration, see *Table B*.

NOTES

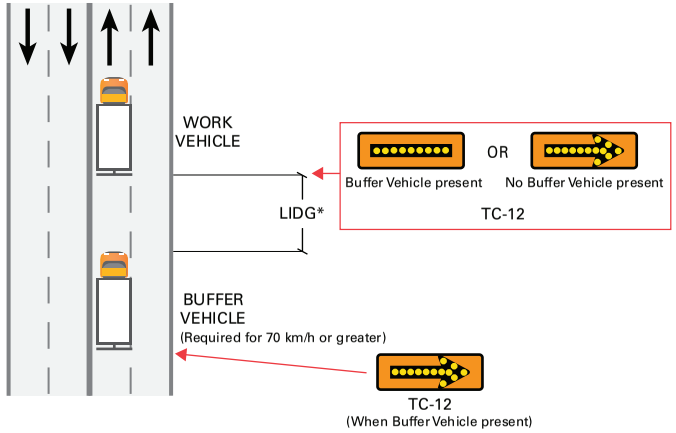
i) Left Lane Closed: mirror image for divided roads only. For Left lane closed, TC-3R, TC2A or A, TC-1 are to be repeated on opposite shoulder where NPRS is 70km/h or greater.

ii) For Left Lane Closed Undivided or with no shoulder, see TL-26.

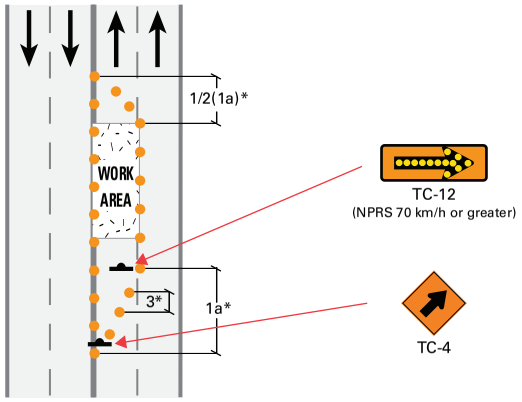
Figure TL-25 Left Lane Closed or Occupied - Undivided or No Shoulder

- ☐ Two-Lane
- ☑ **Multi-Lane**
  - ☑ **Undivided Non-freeway**
  - ☑ **Divided Non-freeway**
  - ☐ Freeway
- ☑ **Mobile Operations**
- ☑ **Very Short Duration**
- ☐ Short Duration
- ☐ Long Duration

With work vehicle - Mobile or VSD



No work vehicle - VSD



* See *Table A*. For LIDG*, see *Table D*.

NOTES

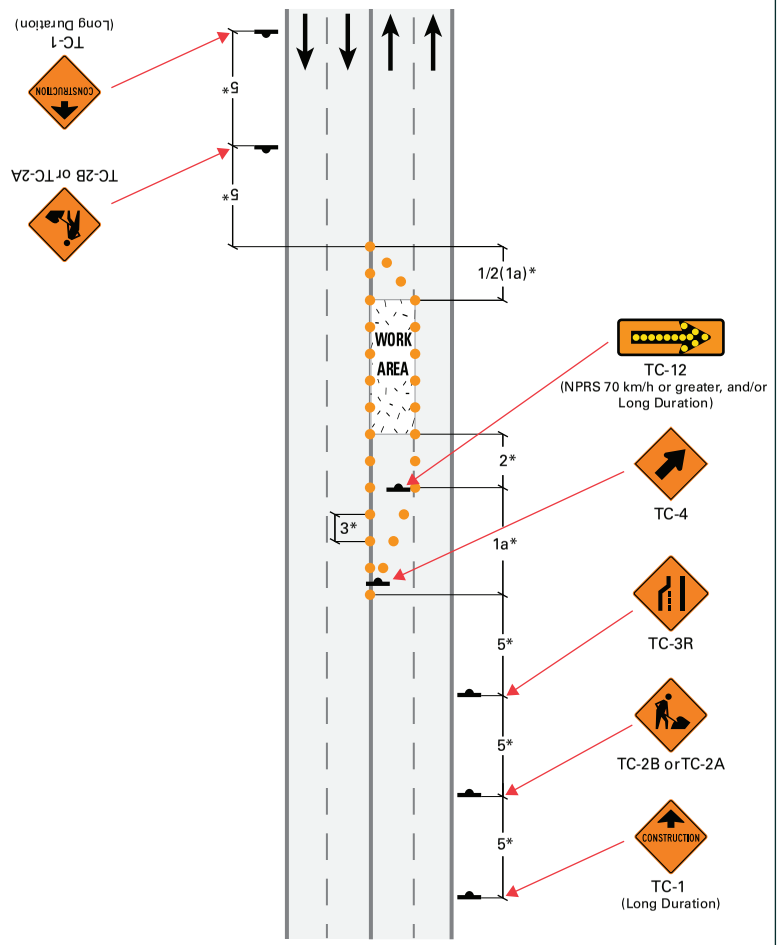
i) Distance between sign truck and work vehicle may be adjusted to accommodate hills, curves, restricted visibility, or other site specific conditions.

ii) Centreline delineation is not required on divided roads.

Figure TL-26 Left Lane Closed - Undivided or No Shoulder

- ☐ Two-Lane
- ☑ **Multi-Lane**
  - ☑ **Undivided Non-freeway**
  - ☐ **Divided Non-freeway**
  - ☐ Freeway

- ☐ Mobile Operations
- ☐ Very Short Duration
- ☑ **Short Duration**
- ☑ **Long Duration**



* For Short Duration, see *Table A*. For Long Duration, see *Table B*.

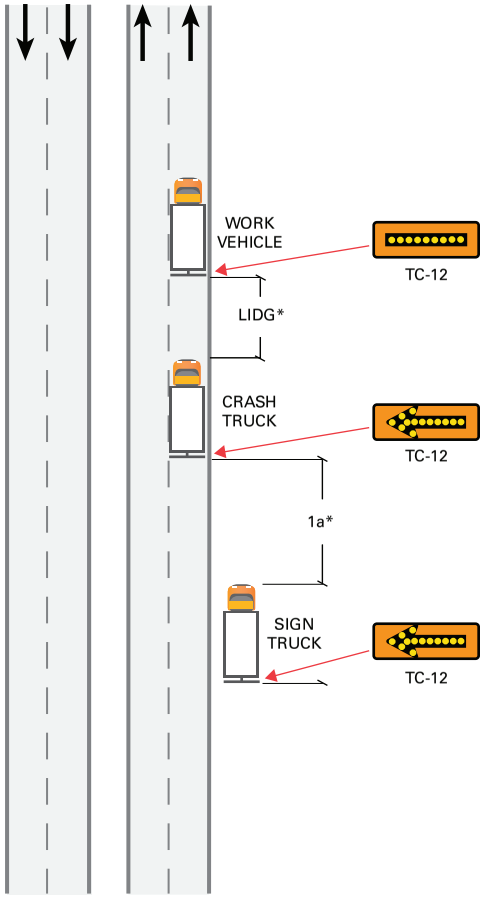
NOTES

i) Centreline delineation and advance warning signs on opposite direction (TC-1 & TC-2) are not required on divided roads.

Figure TL-27 Right or Left Lane Closed or Occupied

- ☐ Two-Lane
- ☑ **Multi-Lane**
  - ☐ Undivided Non-freeway
  - ☐ Divided Non-freeway
  - ☑ **Freeway**

- ☑ **Mobile Operations**
- ☐ Very Short Duration
- ☐ Short Duration
- ☐ Long Duration



* For Freeways, see *Table C*. For LIDG*, see *Table D*.

NOTES

i) Distance between Sign Truck and Crash Truck may be adjusted to accommodate hills, curves, restricted visibility, or other site specific conditions.

ii) Left Lane Closed: mirror image of Right Lane Closed, where shoulder exists. Where no shoulder Sign Truck maybe eliminated and the TC-12 on the Work Vehicle should be in arrow mode. Optionally a Crash Truck with TC-12 in arrow mode can replace the Sign Truck and follow in the occupied lane.

TRAFFIC CONTROL PLAN

This form is to assist project supervisors / traffic control supervisors in assessing the factors relating to traffic control and develop traffic control plans appropriate to the site. The intent of traffic control is to clearly direct and control the flow of traffic with as little interruption to the normal flow as possible. Misuse, lack of, or over use of traffic control devices can increase the traffic hazards to workers on this and future work sites. Any sign not necessary must be turned or removed as soon as possible. ***Refer to Book 7 Ontario Traffic Manual – Temporary Conditions***	
Plan Date:	
Exact Site Location:	
Project Supervisor:	
Traffic Control Supervisor:	**Traffic Control Persons** ***(name and employer):***
Description of Work Activity: Road Construction including:	
Start Date:	**Completion Date:**

Site Factors (Risk Assessment)

CONSIDER:	
Road Alignment: winding, straight, hilly, banked, etc.	
Road Type: divided, undivided, number of lanes	
Sight Distance: signs, trees, buildings & other obstructions	
Approaches: hills, curves, intersections, accesses, etc	
Regulated Speed: **Traffic ,**	
Surrounding Land Use: commercial, industrial, residential, etc	
Residential Areas: driveways, school buses, schools, etc.	
Weather Conditions: clear, icy, wet, foggy, limited visibility, etc.	
Site Hazards: rock falls, avalanche paths, runaway lanes, steep hills, wildlife, etc.	

Traffic Plan

Consider the above site factors when determining the traffic control plan. Site factors should support the decisions regarding traffic control.

CONSIDER:	
• Traffic control supervisor	***Book 7 Ontario Traffic Manual – Temporary Conditions, to be used as a reference guide***
• Site/procedural factors	
• Types of traffic control devices	
• Spacing of devices	
• Advanced warning area	
• Transition area	
• Buffer area	
• Work area	
• Termination area	
• Delineation during off hours	
• Moving signs	
• Turning/removing signs	
• Checking devices	
• Traffic Control Persons:	

TRAFFIC CONTROL PLAN –PAGE 2

Site Diagram (use additional page if needed): Show all site factors affecting traffic control, traffic control devices, spacing, etc.

Traffic Control Plan Developed by:

Site Discussion:

Name:	**Signature:**

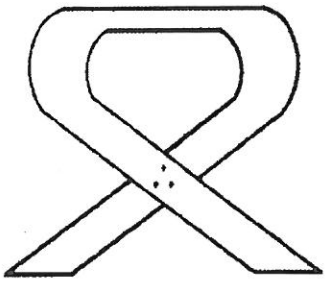
REVERSING VEHICLE CONTROL PLAN –PAGE 3

Site Diagram (use additional page if needed): Show all site factors affecting traffic control, traffic control devices, spacing, etc.

REVERSING VEHCILE Control Plan Developed by:

Site Discussion:

Name:	**Signature:**



RANKIN CONSTRUCTION INC.

222 Martindale Rd. P.O. Box 1116
St. Catharines, Ontario
L2R 7A3
905-684-1111 fax 905-684-2260

605 James Street North 3rd Floor
Hamilton, Ontario
L8K 1K1
905-525-5153 fax 905-525-9110

Tool Box Safety Talk Meeting Minutes

Date:

Time:

Meeting Led by:

Job #

Project Name:

Subjects Discussed:	YES	NO
Personal Safety Equipment		
Hard Hat & Boots		
Safety Glasses		
Safety Vest		
Ear Protection		
Safety Belt, Harness, Lanyard		
Proper Clothing, Gloves, etc.		
Accident Reporting equipment/injury		
Nearest Medical Attention Facility		
Fire Extinguisher & First Aid Kit		
Confined Space		
Reversing Plan		
Traffic Control Plan		
Drugs/Alcohol Forbidden		

Attendee's Name	

Topic of the Day:

Special Concerns on this job:

Other Items/Comments: