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## **CIRCULAR NO. O-13**

### Recommended Practices for Manual Protection of Highway/Railway Grade Crossings

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## 1. SCOPE

- 1.1 These practices are intended to ensure that there are acceptable procedures and instructions in place to permit railway employees to safely perform manual protection at highway/railway grade crossings when:
- a) the uncontrolled movement of traffic could be hazardous to workers;
  - b) work is being performed at or near a railway/road grade crossings;
  - c) automatic warning devices are not working as intended; or
  - d) signal lights, gates, and other protective devices are broken or damaged.
- 1.2 Except as otherwise noted, this circular is intended to apply to manual protection performed by engineering employees, contractors working on behalf of the railways or other authorized and qualified persons. Train and Engine Crews required to manually protect crossings will continue to be governed in accordance with the provisions of the Canadian Railway Operating Rules (CROR) and individual railway operating instructions.

## 2. GENERAL PRINCIPLES

- 2.1 Manual protection of highway/railway grade crossings should be carried out in a manner that provides roadway users with a message consistent to that which they encounter for other roadway flagging situations.
- 2.2 Clear instructions must be in place between railway and highway flag-persons when both are involved in a manual protection plan.
- 2.3 Vehicles should not be left in a location which could interfere with the view of grade crossing warning systems or flag-persons.
- 2.4 Unnecessary prolonged activation of railway crossing warning systems should be avoided.

## 3. DEFINITIONS

- 3.1 Flag-person means a responsible employee or contractor qualified by the railway company or the road authority to stop or otherwise direct and control highway traffic through a grade crossing through instruction and a demonstrated knowledge of this circular and all other applicable rules, procedures and instructions.
- 3.2 Foreman means the designated employee in charge of work at the grade crossing.
- 3.3 Grade crossing means a location where a public highway, road, street, or unrestricted private roadway and associated sidewalks and any pedestrian or bicycle pathway cross one or more railway tracks at grade.
- 3.4 Qualified person means a person who, because of their knowledge, training and experience is qualified to perform that duty safely and properly.



- 3.5 Railway company means a railway company that owns or operates over the line of railway at the grade crossing.
- 3.6 Road Authority means the public agency that has the legal authority to open and maintain a road that passes across the line of railway at the grade crossing.
- 3.7 Traffic means all road users including drivers, cyclists and pedestrians that may use a grade crossing.
- 3.8 Traffic control means a method used for warning traffic and protecting track work at or near grade crossings.
- 3.9 Traffic control plan means the plans or written procedures detailing the traffic accommodation activities for a grade crossing project. Traffic control plans must be approved by the proper road authority.



## 4. PROTECTION REQUIRED

### 4.1 Malfunction of Automatic Warning Systems

a) When a railway company is aware that an automatic grade crossing warning system malfunction has taken place, a qualified person shall arrange for appropriate means of warning highway traffic and railway employees. This may include but is not limited to:

- i. Train and engine crews providing manual protection until the train or engine movement fully occupies the crossing;

A qualified flag-person providing manual protection in accordance with Section 6, until the on-track equipment has cleared the crossing;

- ii. A uniformed police officer providing manual protection in accordance with practices acceptable to their organization until the on-track equipment has cleared the crossing; and
- iii. In the case of workers at or near the crossing, a lookout to warn workers of approaching traffic.

b) A malfunction of a warning system at or near a grade crossing includes:

- i. An activation failure, a partial activation or a false activation of an automatic warning system or any of its components.
- ii. When traffic signal pre-emption systems, designed to operate in conjunction with the automatic warning system at or near a grade crossing, will not operate or will not operate properly. In this case, the road authority must be notified immediately.

c) Movement of trains where there is known to be a malfunction of an automatic warning system shall be governed in accordance with current company operating instructions and Canadian Rail Operating Rules.

### 4.2 Traffic Control for Very Short Duration Work

In instances where maintenance work at a grade crossing may be of very short duration and will have a minimal impact on traffic, a qualified person at the location must review the activity and assess the need for traffic control measures. Depending on the work to be performed, control measures could include items such as a lookout to warn workers of approaching traffic, flag persons and/or advance warning signage.

a. Examples of such activities would include but not be limited to:

- i. Removal of snow and ice build up in flange ways;
- ii. Repair of high spikes;
- iii. Visual ground inspection of track and signal equipment;
- iv. Testing the operation of a grade crossing warning system.



- v. Removal of isolated debris from crossing surface; or
- vi. When required, parking a vehicle on the shoulder of the road or the right-of-way in the immediate vicinity of grade crossing.

b. All workers must wear high-visibility reflective apparel and any work vehicles in the vicinity must employ 360 degree flashing lights and/or 4-way emergency flashers.

c. In all cases the railway company shall safely restore normal operations of the system as soon as possible.

#### 4.3 Traffic Control for Scheduled Work in the Vicinity of a Grade Crossing

When carrying out scheduled work in the vicinity of a highway/railway grade crossing, except as provided in Sections 4.1 and 4.2 above a sufficient number of flag-persons or other means of manual or positive protection, must be provided when:

- a) Work is to be carried out on a line of the railway that may cause obstruction of sightlines at a grade crossing not equipped with an automatic warning system when there is the possibility of the operation of a train.
- b) The crossing warning system which includes either the warning lights with or without gates, advance warning system, or interconnected traffic signals or prepare to stop signs are unable to operate properly due to scheduled maintenance or construction work within the rail approach to the crossing or the road approach to the crossing when there is the possibility of the operation of a train.
- c) Work equipment is close enough to the crossing to obstruct the motorist view of approaching trains or is continuously activating the warning system.
- d) Testing of a grade crossing warning system causes operation of the light units or gate arms at the same time that a train or other railway equipment may enter onto the operating control circuits of the warning system.
- e) Traffic is required to pass a worker, equipment or other obstruction, that may block all or part of the traveled roadway, except as outlined in Section 4.2 above (Very Short Duration Work).
- f) Train movements are anticipated and the presence of track units or work equipment could lead to confusion for highway users.
- g) Should the work affect the crossing for an extended period of time or result in roadway lane closures, the road authority must be notified in advance as provided for in Section 4.4



- 4.4 Traffic Control for Lane Closures and Long Duration Construction Work  
Before undertaking work which will require the regulation of traffic over a grade crossing for an extended period of time or which will require lane closures, the road authority must be notified well in advance and :
- a. A written traffic control plan must be prepared (see Figure 2 below);
  - b. A flag-person or other mutually agreed to means of manual protection in accordance with the traffic control plan must be provided;
  - c. The foreman or other person in charge of the work must:
    - i. Be governed by instructions from the road authority ensuring the flagging protection procedures to be followed for such work conforms to the applicable provincial or road authority requirements;
    - ii. Ensure that all protective devices as determined above are in place prior to commencement of work;
    - iii. Determine who will perform the flagging duties, whether the road authority, railway personnel or a contractor;
    - iv. Ensure detailed instructions and job briefings are provided to persons performing traffic control duties; and
    - v. Notify Signals and Communications of work to be done at the crossing and arrange for the Signal Maintainer or other authorized and qualified person to isolate/deactivate/reactivate automatic warning devices, if applicable.

## 5. EQUIPMENT REQUIRED

- 5.1 For daytime grade crossing work requiring manual protection, each flag-person shall be provided with:
- a. A traffic control hand held approved STOP/SLOW paddle as shown in Figure 1 below is recommended. A red flag may be used when a STOP/SLOW paddle is not available;
  - b. Approved high visibility reflective vest or similar apparel;
  - c. Required personal protective equipment;
  - d. An effective means of communication when flag-persons are not visible to each other.
- 5.2 A flag-person used for scheduled or construction work must have the following clothing and equipment:
- a. A STOP/SLOW sign as shown in Figure 1 below, mounted on a 4 foot long pole;
  - b. Approved high visibility reflective vest or similar apparel;
  - c. Required personal protective equipment;
  - d. An effective means of communication when flag-persons are not visible to each other;
  - e. The appropriate traffic cones, barricades, signs, lighting and other traffic control devices prescribed by the province in which the work is being performed.



These requirements may be altered or augmented as necessary to meet the requirements prescribed by the province and the traffic control plan.

- 5.3 During the hours of darkness, or in other conditions of poor visibility, in addition to the above equipment requirements, each flag-person is to be provided with a working flashlight which may be fitted with a red signalling baton or a lit red fusee.

## 6. FLAGGING PROCEDURES

### 6.1 General Procedures

- a. During traffic control each flag-person must remain on duty at the assigned station until relieved.
- b. Except as provided by section 6.4, a flag-person must not direct traffic for more than one lane at the same time.
- c. A flag-person shall not perform any other work while physically directing vehicular traffic.
- d. A flag-person must stand in a safe position on the side of the lane he/she is flagging with an unobstructed view of approaching traffic.
- e. A flag-person must ensure that it is safe for a movement to proceed before signalling for that movement to proceed.
- f. No employee other than the flag-person may give signals to a motorist except in an emergency.
- g. Only one flag-person may give a signal to a motorist at one time.
- h. A flag-person must make all motions and signals for traffic control precisely and deliberately so that the meaning of signals is clearly understood.

### 6.2 Hand Signals

- a) When using a STOP/SLOW paddle a flag-person must:
  - i. Use the normal signals shown in Figure 3 below when stationed on the driver's right side of the traffic lane under the flag-person's control.
  - ii. The signals shown in Figure 3 below will be reversed when the flag-person is stationed on the drivers left side.
  - iii. The flag-persons sign must not be used to wave traffic on and must never be displayed to traffic in other than a static manner.
- b) When using a red flag, a flag-person must use the following procedures:
  - i. To stop traffic; Face traffic and extend the flag staff horizontally across the traffic lane in a stationary position so that the full area of the flag is visibly hanging below the staff. The free arm shall be held with the palm of the hand above the shoulder level toward approaching traffic.
  - ii. To direct traffic to proceed; Stand parallel to the traffic movement and with flag and arm lowered from the view of the road users, motion with the free hand for road users to proceed. Flags shall not be used to signal traffic to proceed.
  - iii. To alert or slow traffic; face traffic and slowly wave the flag in a sweeping motion of the extended arm from shoulder level to straight down without raising the arm above a horizontal position. The flag-person shall keep the free hand down.





### 6.3 Emergency Vehicles

Emergency vehicles such as fire trucks, police vehicles, and ambulances pose special problems for flag-persons and emergency procedures to be used should be known prior to commencement of flagging operations.

- a. When the flag-person becomes aware that an emergency vehicle is approaching, he or she should immediately contact the other flag-persons in order to open a path for the emergency vehicle(s).
- b. If there is a hazard that will affect the safety of an emergency vehicle, yourself or others, the emergency vehicles must be stopped, even ever so briefly, in order to relay specific instructions.

### 6.4 Traffic Control with one Person

Whenever one person is required to flag at crossings where vehicles can move in either direction or more than one lane is involved the flag-person should:

- a. Speak to the driver of the first vehicle stopped to ensure that he/she remains stopped clear of the crossing while the flag-person stops vehicles arriving from the other direction, or from an adjoining lane.
- b. When stopping vehicles at a crossing with more than one track, the flag-person should first stop the vehicle whose line of site is most restricted

### 6.5 Traffic Control Signs

- a. When traffic control is scheduled or of long duration, signs advising of a flag-person head should be placed in advance of each flag-person's station. (examples shown in Figure 2).
- b. Signs must be erected as per instructions from the road authority.
- c. Signs must be checked to ensure they are functioning as intended.
- d. Signs must be removed promptly upon completion of work.

### 6.6 Scheduled and Construction Work Requiring Traffic Control Plans

- a. A detailed traffic control plan must be written and approved by the road authority.
- b. These plans should include communication procedures, job briefings and situational awareness.
- c. Detailed instructions must be given to the flag-person(s) along with job briefings.
- d. Unless otherwise identified in the traffic control plan grade crossing protection shall be in conformity with the requirements of the Manual of Uniform Traffic Control Devices for Canada (MUTCD).
- e. Road closures and barriers should be considered whenever work at a grade crossing is being planned. Barricades must only be placed as per the road authority's instructions.

### 6.7 Notification of the Signal Maintainer or Other Authorized Personnel

Scheduled track work must not be performed within the limits of an automatic warning system at a grade crossing until the signal maintainer or other authorized and qualified



person has been notified. Only Signals and Communications personnel may isolate/deactivate/reactivate automatic warning systems at grade crossings

## **7 ON TRACK SAFETY PROCEDURES**

### **7.1 Hi-Rail Vehicles at Grade Crossings**

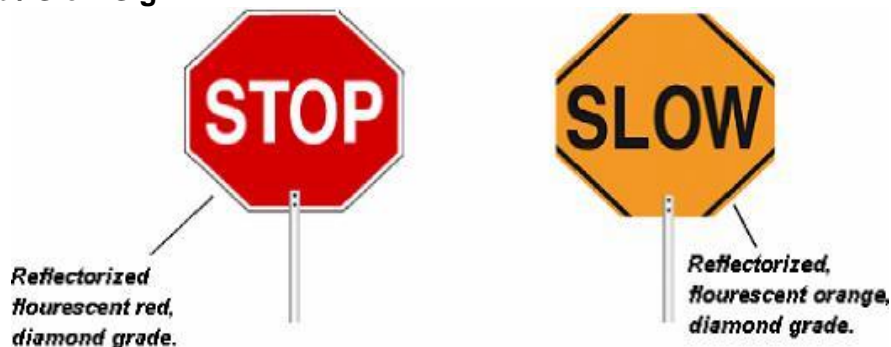
When hi-rail vehicles are being removed from or placed on the track, at or near a grade crossing, employees must warn the traveling public by:

- a. Displaying 360 degree flashing light and four way emergency flasher, if equipped.
- b. Wearing high-visibility reflective apparel and appropriate personal protective equipment.
- c. Employees must watch for highway vehicles and provide flagging if conditions require such an action.
- d. When road traffic volume warrants, road traffic must be stopped before attempting to mount or dismount the track with the hi-rail vehicle. This can be accomplished by:
  - i. stopping traffic in each direction and requesting the motorist to hold his position until the hi-rail is clear of the crossing, or
  - ii. where equipped, manually activating the automatic warning system.



- 7.2 Track Units & Hi-Rail Vehicles at Highway-Rail Grade Crossings
- Any track unit or hi-rail vehicle that may not activate track circuits must be operated with caution when approaching highway-rail grade crossings. This includes giving highway traffic preference and
- Approaching grade crossings under complete control, being prepared to stop if necessary.
  - A track unit must not obstruct a highway-rail grade crossing until the way is seen to be clear by the operator of the track unit.
  - A track unit must be brought to a full stop before proceeding over a grade crossing when the view of the approach is obstructed or when traffic is heavy.
  - If the operator of the track unit after stopping cannot determine that the way is clear must only proceed over the crossing under the protection of a flag-person, except a track unit being operated by one person alone may, after stopping, proceed with extreme caution.

Figure 1 Stop / Slow Sign



The STOP/SLOW paddle shall have an octagonal shape on a rigid handle. STOP/SLOW paddles shall be at least 450 mm (18 in) wide with letters at least 150 mm (6 in) high. The background of the STOP face shall be red with white letters and border. The background of the SLOW face shall be orange with black letters and border. When used at night the STOP/SLOW paddle shall be reflectorized.

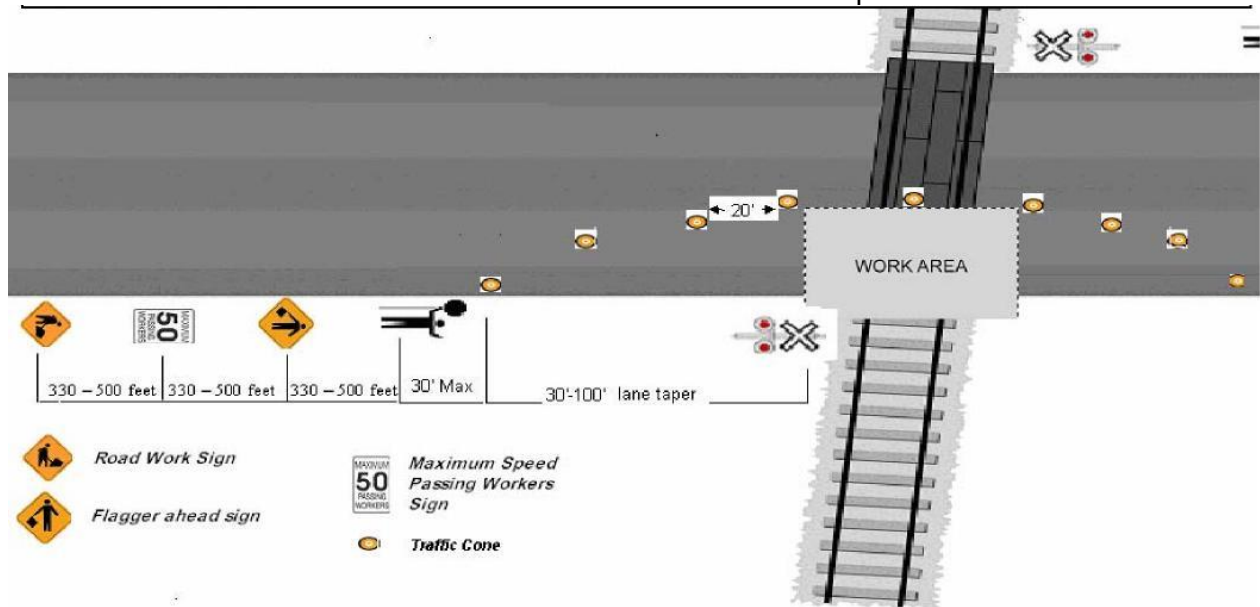
**Note: All traffic control equipment, including signs and personal protective equipment must be kept clean and in working condition.**



### Figure 2 Traffic Control Plan

Diagram shows an example of a traffic control plan for protecting work at a grade crossing. (Two way traffic, single lane closure)

Each situation will require individual safety assessment, and consideration must be given to traffic volume, vehicle types, sightlines and distances, sign spacing, duration of work and other factors to ensure traffic control devices are adequate in each case.



Note: This is an example only. Signs should be placed as per traffic control plan developed with the proper road authority.

1. All signs shall be spaced 330-500 feet (100-150 meters) apart unless otherwise indicated. Figure 3 Hand Signals when Stop/Slow Paddle is used for Traffic Control
2. All signs shall be kept clean and in good condition.
3. Identical signing is required from both directions.
4. The bottom of sign should not be less than 1' (30 cm) above the road surface.
5. All signs must be in accordance with instructions from the road authority
6. Traffic cones are placed at 20 foot (6 meter) maximum intervals when flag-persons are used.
7. Lane taper must not exceed 100' (30 meters) or be less than 30' (10 meters) when flag-persons are used.
8. No vehicles shall be parked on road unless required for actual operations.
9. Traffic Control plan must document procedures to follow to accommodate emergency vehicles. Flag-persons must discuss and understand these procedures prior to commencement of flagging operations.



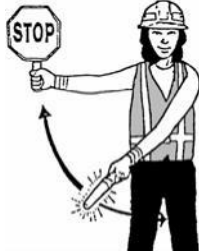
Figure 3 Hand Signals when Stop/Slow Paddle is used for Traffic Control

To Stop Traffic



(A) By day

- Face Traffic
- Display “STOP” paddle in right hand.
- When approaching vehicle has almost stopped use left arm to indicate stopping point.



(B) By night

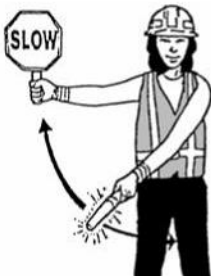
- Face Traffic
- Display static reflectorized “STOP” paddle in right hand and flashlight with red signaling baton attached in left hand. - Move right arm from 3 to 6 o’clock
- When approaching vehicle has almost stopped, use flashlight/baton to indicate stopping point.

To Slow Traffic



(A) By day

- Face Traffic
- Display Static “Slow” paddle in right hand.
- If traffic slows below desired speed give appropriate “Move Traffic Signal”.

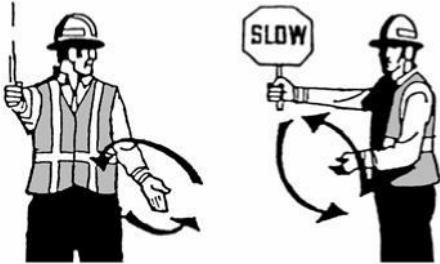


(B) By night

- Face Traffic
- Display static reflectorized “slow” paddle in right hand, and flashlight with red signaling baton attached, in left hand.
- Move right arm from 3 to 6 o’clock.
- If traffic slows below desired speed give appropriate “Move Traffic” signal.

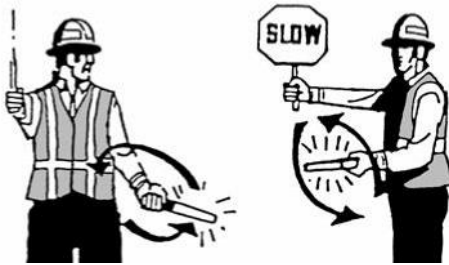


**To Move Traffic**



**(A) Slowly by day**

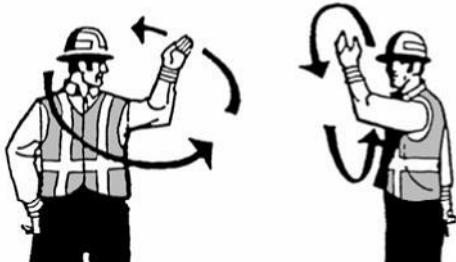
- Face across the approach lane and look across left shoulder at traffic to be moved.
- Display Static “SLOW” paddle in right hand. - Advance traffic by rotating lower left arm in an elliptical manner in the direction the vehicle wheels will rotate.



**(B) Slowly by night**

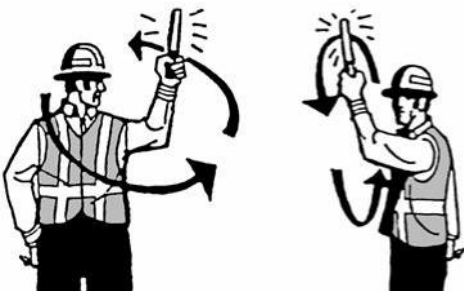
- Face across the approach lane and look across left shoulder at traffic to be moved.
- Display static “Slow” paddle in right hand and flashlight, with red signaling baton in left hand. - Advance traffic by rotating lower left arm in an elliptical manner, in the direction vehicle wheels will rotate.

**To Move Traffic**



**(A) At posted speed by day**

- Face across the approach lane and look across left shoulder at traffic to be moved.
- Lower right arm to conceal paddle and motion traffic on with left arm at shoulder level.



**(B) At posted speed by night**

- Face across the approach lane and look across left shoulder at traffic to be moved.
- Hold flashlight with red signaling baton in left hand.
- Lower right arm to conceal paddle and motion traffic on with left arm at shoulder level