Highway Crossings Protective Devices:  
Guidelines for British Columbia’s Provincial Industrial Railways

Guidelines Respecting the Installation and Testing of Protective Devices at Highway Crossings at Grade

SHORT TITLE
1. These Guidelines may be cited as the Highway Crossings Protective Devices Guidelines.

INTERPRETATION
1.1 (1) In these Guidelines,  
“BCSA” means British Columbia Safety Authority, and  
“MOTI” means the provincial Ministry of Transportation and Infrastructure.

APPLICATION
2. Protective devices of the flashing light type installed by railway companies subject to the jurisdiction of the MOTI, pursuant to an order of the MOTI, shall comply with the specifications contained in these Guidelines for protective devices of the flashing light type, and shall be maintained and tested in accordance with these Guidelines.

3. Unless otherwise ordered by the MOTI, protective devices installed prior to February 1, 1965, are not required to conform with the specifications herein, but such protective devices shall be maintained and tested in accordance with these Guidelines.

4. In these Guidelines, “company” means the railway company responsible for the installation, maintenance and testing of the protective device signals ordered by the MOTI.

PART I

FLASHING LIGHT TYPE (WITH OR WITHOUT GATES)
5. When the MOTI orders the installation of a protective device of the flashing light type, the railway company concerned shall submit to the authority having jurisdiction over the highway for its approval as to location of the protection in relation to the highway and the railway, four copies of a plan showing the layout and containing the following information:

(a) minimum length of operating circuit;
(b) maximum distance from the signal to clearance on the opposite side of the track or tracks;
(c) distance from the centre of signal to centre of travelled roadway to the nearest foot, this dimension preferably to be not less than 18 feet measured at right angles to the centre line of the highway;
(d) distance from the centre of signal to the gauge side of the nearest rail to the nearest foot;
(e) length of bracket arm or cantilever structure if used;
(f) clearance above crown of road of the bracket arm or cantilever structure if used; and
(g) speed for which the operating circuits are designed to comply with subsection 12(1).

6. The four copies of the plan referred to in section 5, when approved by the road authority, shall be filed by the railway company with the MOTI for approval by one of its engineers.

7. (1) Unless otherwise authorized by the MOTI, a signal of the flashing light type shall be placed on each side of the tracks and to the right of approaching highway traffic, and each signal shall have not less than four electric light units.

(2) The assembly of apparatus shall conform to drawing of the MOTI set out in Schedule I except that, where the standard assembly cannot be so located due to local conditions, cantilever or bracket signal support or left-hand signals may be used and, where signals are located more than 25 feet from the centre of highway, cantilever signal supports shall be used.

(3) Parts which function as background or hood for light signal indications shall be non-reflecting black; all other parts shall be white or aluminum.

(4) The signboard which forms part of the apparatus, shall have the letters marked in black upon a background painted white, aluminum or of a reflective material satisfactory to the MOTI.

(5) When more than one track is protected, signs shall indicate the number of tracks to be crossed between signals; the signs shall be marked the same as the signboard except that numerals shall be at least 5 1/2 inches high and letters at least four inches high.

8. Electric lights shall flash alternately at the rate of not less than 30 nor more than 50 flashes per minute, and each light shall burn approximately the same length of time during the entire operating time of the signal.

9. Electric light units shall conform to the A.A.R. Signal Section Specification No. 190, or the equivalent; the proper roundel within such specification shall be used as determined by local conditions.

10. Electric light units shall be equipped with a lamp having a rating of at least 18 watts and operated within 10 per cent of rated voltage.

11. When the MOTI orders the installation of a bell, such bell shall be mounted parallel to the highway and form part of the signal, and shall conform to A.A.R. Signal Section Specification No. 44, or the equivalent.

12. (1) Signals shall operate for not less than 20 seconds before the crossing is entered by a train at a speed in excess of 10 m.p.h.; provided that where the distance as measured parallel to the centre line of the highway between the governing signal and clearance on the opposite side of the farthest protected track on which trains operate in excess of 10 m.p.h. is more than 35 feet, the operation time of 20 seconds shall be increased one second for each additional 10 feet or fraction thereof; signals shall continue to operate until the train has cleared the crossing.

(2) Signals shall operate for not less than seven seconds before the crossing is entered by a train at a speed of 10 m.p.h. or less; signals shall continue to operate until the train has cleared the crossing.

13. Where train speeds on a main track vary considerably, additional control circuits may be required with timing devices so arranged that a warning time, adequate for the slower trains, will be automatically adjusted.
14. (1) Cut-out controls may be required to minimize unnecessary operation of the signals when trains make regular operating stops or perform switching operations within the operating circuits.

(2) If such controls are automatically operated, circuits shall be so designed or train speed restricted as to ensure the required operating time of signals when the train again proceeds towards the crossing.

(3) Automatic control to actuate the signals by approaching trains, other than the train that has stopped or is performing switching operations, shall take preference over such cut-out features.

(4) Means shall be provided to ensure restoring of such controls to automatic operation.

15. The normal functioning of any device shall not be interfered with in testing or otherwise, without first taking adequate measures for the safety of the traffic which depends on the normal operation of such devices.

16. When gates are required, they shall be installed as adjuncts to signals of the flashing light type and shall comply with the following additional requirements for this type of protective device:

(a) the assembly of the gate apparatus shall conform with the drawing of the MOTI set out in Schedule II;
(b) a gate shall be placed on each side of the track, preferably at right angles and to the right of approaching highway traffic;
(c) when such gate indicates the approach of a train, it shall present to approaching highway traffic the aspect of an arm equipped with red lights being lowered across the lane or lanes used by highway traffic or at rest in a horizontal position across such lanes;
(d) the gate mechanism shall preferably be mounted on the same mast as the flashing light signal;
(e) each gate shall be equipped with an independent operating mechanism;
(f) each gate arm shall be equipped with not less than three red lights arranged to shine in both directions along the highway; such lights shall operate at all times when the gate is in position to obstruct highway traffic; such lights shall be located and operated as follows:
   (i) the light nearest the tip shall be not less than 14 nor more than 36 inches from the tip of the arm and burn steadily, and
   (ii) the other two lights shall be located to suit local conditions and to flash alternately in unison with the lights on the signal;
(g) the gate arms shall have alternate diagonal stripes of black and white on both sides, 16 inches wide, and all other parts shall be white or aluminum;
(h) the gate arms when not indicating the approach of a train shall not interfere with highway traffic;
(i) the gate arms shall operate uniformly, smoothly, and complete all movements without rebound or slap, and shall be securely held when in raised position;
(j) the mechanism shall be so designed that if the gate arms, while being raised or lowered, strike or foul any object, they will readily stop and, on removal of the obstruction, the mechanism should assume the position corresponding with the control apparatus;
(k) so far as practicable, the design of the gate operating mechanism will ensure proper operation during all weather conditions, and so that, when such operating mechanism is out of order, the gate arms will assume the horizontal position across the highway;
(l) circuits for operation of the gate shall be arranged so that the gate arms
   (i) start their downward motion not less than three seconds after the signal lights start to operate,
(ii) reach full horizontal position before any train on a main track reaches the crossing, and
(iii) remain down until the train has cleared the crossing.

17. Signals, gates, operating mechanisms and control circuits shall be in accordance with A.A.R. recommended practice.

18. The instrument cases shall be locked when not being used.

19. (1) All highway crossing protective devices shall be maintained by the company to operate as intended and shall be tested as follows: for all crossings protected by flashing light signals and bells, or by flashing light signals, bells and gates, the tests shall be made at least once in each calendar week.
(2) The method of tests shall be such as will indicate whether or not the highway crossing protective devices are in good working order. If the highway crossing protective devices operate improperly or fail to operate, notice shall be given as soon as possible by the railway employee discovering such improper operation or failure so that advice promptly reaches the department having charge of the operation and repair of such highway crossing protective devices. As soon as possible after the receipt of such notice, a flagman shall be placed at such crossing in order that all users of the said crossing may be protected until the highway crossing protective device concerned has been repaired. If the protection is for more than four tracks, two flagmen shall be used.

20. (1) When the MOTI, by order, has apportioned the cost of maintenance of any highway-railway crossing signals, the company shall not, except in case of emergency brought about by accident or other conditions where immediate action is necessary, and except as provided in subsection (2), begin any major repair, the cost of which exceeds $1,000 without leave of the MOTI and notice sent to other parties required to share in the maintenance cost of the crossing signal.
(2) When all parties required to share in the cost of maintenance of the crossing signals agree with the company to share in the payment of the cost of the major repairs referred to in subsection (1), no leave of the MOTI is required before beginning such major repairs.

21. The MOTI may, by order, in respect of any single railway company, amend any requirement of this Part.

PART II

OTHER THAN FLASHING LIGHT TYPE (WITH OR WITHOUT GATES)

22. (1) All highway crossing protective devices, other than flashing light type (with or without gates), shall be maintained by the company to operate as intended and shall be tested as follows: for all crossings protected by bell and danger signs, or by mechanical gates, or by wigwag signals, the tests shall be made at least once a day, except during weekends and legal holidays when not more than two days may elapse on which no test is made.
(2) The method of tests shall be such as will indicate whether or not the highway crossing protective devices are in good working order. If the highway crossing protective devices operate improperly or fail to operate, notice shall be given as soon as possible by the railway
employee discovering such improper operation or failure so that advice promptly reaches the department having charge of the operation and repair of such highway crossing protective devices. As soon as possible after the receipt of such notice, a flagman shall be placed at such crossing in order that all users of the said crossing may be protected until the highway crossing protective device concerned has been repaired. If the protection is for more than four tracks, two flagmen shall be used.

23. (1) When the MOTI, by order, has apportioned the cost of maintenance of any highway-railway crossing signals, the company shall not, except in case of emergency brought about by accident or other conditions where immediate action is necessary, and except as provided in subsection (2), begin any major repair, the cost of which exceeds $1,000, without leave of the MOTI and notice sent to other parties required to share in the maintenance cost of the crossing signal.

(2) When all parties required to share in the cost of maintenance of the crossing signals agree with the company to share in the payment of the cost of the major repair referred to in subsection (1), no leave of the MOTI is required before beginning such major repairs.
SCHEDULE I

HIGHWAY GRADE CROSSING SIGNAL OF THE FLASHING LIGHT TYPE
SCHEDULE II

GATES AT HIGHWAY CROSSINGS