Level Crossing Interface Requirements

Synopsis
This document mandates the control, command and signalling requirements for level crossing equipment, so that level crossing functionality is compatible with infrastructure manager operations at stations and railway undertaking operations.

This document contains requirements that are amended under the Railway Group Standards Code (Issue Three) as a small scale change. Reference to the amended requirements is made in the ‘Issue record’. All other parts of the document are unchanged from the previous issue.

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Supply

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Level Crossing Interface
Requirements

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Part 1  Purpose and Introduction

1.1  Purpose

1.1.1  This document mandates:

a) The control, command and signalling requirements for level crossing equipment, so that level crossing functionality is compatible with infrastructure manager operations at stations and railway undertaking operations, and

b) Some of the operational measures that relate to the operation and use of level crossings by railway undertakings and infrastructure managers operating stations.

1.2  Introduction

1.2.1  Background

1.2.1.1  Level crossing systems are provided by the infrastructure manager to manage the risk at the intersection at the same elevation of a road, footpath or bridleway and one or more rail tracks.

1.2.1.2  The infrastructure manager provides level crossing equipment to display warnings to level crossing users, and signalling equipment to display movement authorities at level crossings to train drivers.

1.2.1.3  Where the infrastructure manager wholly operates the level crossing equipment and the signalling equipment:

a) Railway undertakings control train movements at level crossings by complying with the movement authorities displayed by signals, lineside operational signs and indicators, and

b) Level crossing users cross the railway when the level crossing warning devices provided are not activated.

1.2.1.4  Some types of level crossing require operation of level crossing equipment by authorised railway staff employed by railway undertakings (typically train crew operated level crossings and locally monitored automatic level crossings).

1.2.1.5  Staff level crossings are provided at some locations for use by railway staff employed by railway undertakings (typically as part of authorised walking routes and where barrow crossings are provided for use by platform staff).

1.2.1.6  This document defines the level crossing equipment requirements at the interfaces between:

a) The infrastructure manager providing the level crossing and railway undertakings, and

b) The infrastructure manager providing the level crossing and other infrastructure managers operating stations.

1.2.1.7  GE/RT8270 Assessment of Compatibility of Rolling Stock and Infrastructure, sets out the requirements for assessing compatibility between level crossing systems and railway operations.
1.2.2 Related requirements in other documents
1.2.2.1 The following Railway Group Standards set out requirements that are relevant to the scope of this document:

GI/RT7033 Lineside Operational Safety Signs

GK/RT0045 Lineside Signals, Indicators and Layout of Signals

GK/RT0075 Lineside Signal Spacing and Permissible Speeds

GE/RT8037 Signal Positioning and Visibility

1.2.3 Supporting documents
1.2.3.1 The following Railway Group document supports this Railway Group Standard:

GK/GN0692 Guidance on Level Crossing Interface Requirements

1.3 Approval and authorisation of this document
1.3.1 The content of this document was approved by Control Command and Signalling (CCS) Standards Committee on 13 September 2012.

1.3.2 This document was authorised by RSSB on 25 October 2012.
Part 2

Requirements for Level Crossing Interfaces

2.1 Requirements for stop signals and ETCS block markers at level crossings

2.1.1 Stop signals and ETCS block markers at controlled level crossings worked by signallers or crossing keepers

2.1.1.1 A stop signal or ETCS block marker shall be provided on each signalled approach to controlled level crossings that require movement authorities to be withdrawn before being opened to road traffic. Further requirements for stop signals are set out in GK/RT0045. Further requirements for ETCS block markers are set out in GI/RT7033.

2.1.1.2 Stop signals and ETCS block markers shall be located within 600 m of the level crossing, except where the risk associated with an increased distance is acceptable.

2.1.1.3 Stop signals and ETCS block markers shall be positioned at least 50 m from the level crossing, except where either:

a) The level crossing is immediately beyond a station platform, in which case the stop signal or ETCS block marker associated with the platform shall be positioned at least 25 m from the level crossing, or

b) The signalling system is configured so that movement authorities towards the stop signal or ETCS block marker are only displayed when the level crossing is closed to road traffic.

2.1.2 Stop boards at train crew operated level crossings

2.1.2.1 A stop board shall be provided on each signalled approach to train crew operated level crossings. Further requirements for stop boards are set out in GK/RT0045.

2.1.2.2 The stop board shall be positioned at least 50 m from the level crossing, except where the crossing is immediately beyond a station platform, in which case the stop board associated with the platform shall be positioned at least 25 m from the level crossing.

2.1.3 Stop signals and ETCS block markers at automatic level crossings remotely monitored by the signaller

2.1.3.1 A stop signal or ETCS block marker shall be provided on each signalled approach to automatic level crossings that are remotely monitored by the signaller.

2.1.3.2 Except where alternative arrangements are provided on Radio Electronic Token Block (RETB) signalled lines (see 2.1.3.3) or lines with ETCS level 2 (see 2.1.3.4), stop signals shall be positioned so that the running time at permissible speed from the signal to the level crossing does not exceed 10 minutes.

2.1.3.3 On RETB lines, the stop board at the previous token exchange point shall protect the level crossing. In this case, it shall not be necessary to apply the 10-minute criterion set out in 2.1.3.2 if either:

a) A continuous voice communication system is available between the stop board and the level crossing for the signaller to contact the train driver, and the risk of a train not being stopped is acceptable, or
b) Before passing a designated point within 10 minutes running time on the approach to the level crossing, the driver of each train is required to contact the signaller to obtain permission to proceed over the level crossing.

2.1.3.4 On ETCS level 2 fitted lines (without lineside signals), the previous ETCS block marker shall protect the level crossing. In this case, it shall not be necessary to apply the 10-minute criterion set out in 2.1.3.2.

2.1.3.5 Where all trains are required to stop between the strike-in point and the level crossing, the stop signal or ETCS block marker shall be positioned to indicate the stopping point for the train.

2.1.3.6 Where the stop signal between the strike-in point and the level crossing is a stop board, a driver’s level crossing indicator shall also be provided to authorise the train to proceed. Further requirements for driver’s level crossing indicators are set out in GK/RT0045.

2.1.3.7 The stop signal, ETCS block marker or stop board shall be positioned at least 50 m from the level crossing, except where the crossing is immediately beyond a station platform, in which case the stop signal, ETCS block marker or stop board associated with the platform shall be positioned at least 25 m from the level crossing.

2.1.4 Stop signals and ETCS block markers at automatic level crossings locally monitored by the train driver

2.1.4.1 Where provided, stop signals, ETCS block markers and stop boards shall be positioned at least 50 m from the level crossing, except where the crossing is immediately beyond a station platform, in which case the stop signal, ETCS block marker or stop board associated with the platform shall be positioned at least 25 m from the level crossing.

2.1.4.2 A stop board, or signal capable of displaying a stop aspect, shall be provided on the approach to the level crossing to indicate the stopping point for the train if either:

   a) There is an operational requirement for all trains to stop on the approach to the level crossing (for example, at a station), or

   b) The available visibility of the level crossing area is insufficient to enable a safe crossing speed to be set.

2.1.4.3 Where the level crossing is initiated by train crew using a control device (see 2.8.1), the stop board shall include written instructions that set out the actions to be taken (for example, ‘Press plunger and obtain white light before proceeding’).

2.1.5 Shunting movements over level crossings

2.1.5.1 Where shunting movement authorities can be issued over a level crossing, stop signals, ETCS block markers and shunt entry boards shall be positioned so that:

   a) Shunting movements can pass completely over the level crossing before reversing, and

   b) Trains are not required to stop over the level crossing.
2.1.6 Delayed clearance of signals, delayed display of driver’s level crossing indicators and delayed issuing of ETCS movement authorities

2.1.6.1 Where it is necessary to delay the clearance of a stop signal, delay the display of a flashing white light indication or delay the issuing of an ETCS movement authority, the required time delay shall be determined using acceleration data obtained from the relevant railway undertakings for a light locomotive or any existing or proposed rolling stock which has better acceleration characteristics, which is operated, or is likely to be operated, on the line.

2.2 Train crew operated barrier level crossings

2.2.1 Default position for barriers

2.2.1.1 The default position for barriers at train crew operated barrier level crossings shall be barriers raised.

2.2.1.2 The control of the barriers shall be arranged so that they remain raised if there is a loss of power.

2.2.2 Control and indication system

2.2.2.1 A level crossing control and indication facility shall be provided for use by train crew.

2.2.2.2 The control and indication system functionality and interface shall be determined using the process for assessment of compatibility set out in GE/RT8270, which shall include an assessment of all of the following:

a) The requirement for train crew to initiate the barriers lower sequence
b) The requirement for train crew to initiate the barriers raise sequence
c) The requirement for train crew to stop the level crossing barriers at any position during the lower and raise sequences
d) The requirement for train crew to observe that the barriers are fully raised
e) The requirement for train crew to observe that the barriers are fully lowered
f) The requirement for train crew to observe that the road traffic light signals are operating correctly
g) The requirement for train crew to detect a loss of a primary power supply to the telephone system, where level crossing telephones are provided.

2.2.2.3 The level crossing control and indication facility shall be located so that the train crew:

a) Can conveniently operate the level crossing, and
b) Have a clear view of the approaching road traffic and the whole crossing area.

2.2.2.4 The level crossing control and indication facility shall be secured to prevent unauthorised operation.

2.2.2.5 If an operating device is provided for drivers to operate the level crossing from the driving cab (for example a pull cord), that operating device shall only initiate the closing sequence when a train is detected to be present at the associated stop board.
2.2.6 Where drivers of departing trains are required to confirm that an automatic raising sequence has correctly operated, BU indicators shall be provided. Further requirements for BU indicators are set out in GK/RT0045.

2.2.3 Level crossing operating sequences

2.2.3.1 The level crossing closing sequence shall be as follows:

a) When the closing sequence is initiated, the amber lights of the road traffic signals shall illuminate and the audible warning devices shall begin to sound

b) After approximately three seconds, the amber lights shall be extinguished and the red road traffic light signals shall begin to flash

c) Approximately five seconds after the red road lights have commenced to flash, the barriers shall begin to lower

d) At crossings with four barriers, the entrance barriers shall lower first. The exit barriers shall begin to lower after the entrance barriers have lowered

e) The audible warning shall cease when all of the barriers are fully lowered.

2.2.3.2 Audible warning parameters are set out in Appendix A.

2.2.3.3 The level crossing opening sequence shall be as follows:

a) When the opening sequence is initiated, the barriers shall begin to rise simultaneously, and

b) The red road light signals shall be extinguished when all the barriers have risen to an angle of approximately 45° above horizontal.

2.3 Level crossings with gates

2.3.1 Visibility of level crossing gates

2.3.1.1 When level crossing gates are closed across the railway, they shall be visible to drivers when the train has stopped at the stop board protecting the level crossing.

2.3.2 Gates operated by train crew

2.3.2.1 The default position for level crossing gates operated by train crew shall be closed across the railway.

2.3.2.2 At gated crossings operated by train crew, the gates shall be arranged so that when open to the railway, they close across the road.

2.3.2.3 There shall be a means of securely retaining the gates in both open and closed positions.

2.3.2.4 The means of unlocking or releasing the gates to be closed across the road shall only be available to authorised level crossing operators.

2.4 Footpath and bridleway level crossings

2.4.1 Audible warning arrangements

2.4.1.1 Where audible warnings are required at footpath and bridleway level crossings and fixed audible warning devices are not provided, the requirement for the train driver to sound the train horn to give the audible warning shall be identified using whistle boards positioned on the signalled approach to the level crossing. Further requirements for whistle boards are set out in GI/RT7033.
2.5 Level crossings provided for use by railway staff

2.5.1 Requirements for level crossing instruction signs

2.5.1.1 Instruction signs shall be provided at each level crossing to explain to railway staff how to proceed over the level crossing.

2.5.1.2 Where a level crossing is equipped with a white light visual warning indicator, the instruction sign shall bear the words: ‘Caution – Cross only when light shows’.

2.5.1.3 Where a level crossing is equipped with miniature red/green light units, the instruction sign shall bear the words:
   a) ‘If no light – phone crossing operator’ where there is a telephone, or
   b) ‘If no light – proceed with caution’ where there is no telephone.

2.5.2 Requirements for visual warning indicators

2.5.2.1 Where direct observation of approaching trains is inadequate for the safety of users, visual warning indicators shall be provided.

2.5.2.2 The visual warning indicators shall be located at each access point to the level crossing and positioned so that they are visible from a position of safety.

2.5.2.3 Where there is intermediate access to a level crossing (for example, from a station platform), the separate sections of the level crossing shall be staggered and each section shall be treated as a separate level crossing.

2.5.2.4 Visual warning indications shall be displayed using either:
   a) White light indicators, or
   b) Miniature red/green light units.

2.5.2.5 Where visual warning indications are displayed using white light indicators:
   a) The white light indication shall be illuminated when it is safe to cross, and
   b) The indication shall be extinguished when it is not safe to cross.

2.5.2.6 Where visual warning indications are displayed using miniature red/green light units:
   a) The green light in each light unit shall be illuminated when it is safe to cross, and
   b) The red light in each light unit shall be illuminated when it is not safe to cross.

2.5.2.7 The level crossing minimum warning times shall:
   a) Take account of the use of the level crossing
   b) Be sufficient for a user to traverse the level crossing from the decision point and reach a place of safety at least five seconds before the arrival of a train
   c) Be a minimum of 20 seconds.

2.5.2.8 The level crossing control system shall be designed to prevent incorrect operation of the level crossing warning indications, resulting from user operations.
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2.5.2.9 Where there is a stop signal between the strike-in point and the level crossing:
   a) The level crossing warning shall only be inhibited after a train has passed the strike-in point when the signal is displaying a stop aspect and it is free of approach locking
   b) The clearance of the signal shall be delayed where it is necessary to provide the minimum level crossing warning time (see 2.1.6).

2.5.2.10 On lines signalled with ETCS level 2:
   a) The level crossing warning shall only be inhibited after a train has passed the strike-in point if the limit of movement authority is on the approach to the level crossing
   b) Issue of a movement authority over the level crossing shall be delayed where it is necessary to provide the minimum level crossing warning time (see 2.1.6).

2.6 Automatic level crossings remotely monitored by the signaller

2.6.1 Wrong direction train movements on lines without ETCS level 2
2.6.1.1 Where wrong direction controls are provided, an automatic level crossing wrong direction speed restriction sign shall be provided on the approach to each wrong direction strike-in point. Further requirements for wrong direction speed signs are set out in GI/RT7033.

2.6.1.2 The indicated wrong direction permissible speed shall be the same for all level crossings on that section of route. Further requirements for permissible speeds are set out in GK/RT0075.

2.6.2 Wrong direction train movements on lines with ETCS level 2
2.6.2.1 These requirements have not yet been developed.

2.6.3 Bi-directional control resetting times
2.6.3.1 Where bi-directional controls are provided, the directional control resetting times shall be compatible with the time required for trains to pass clear of the opposite direction strike-in point.

2.7 Automatic level crossings locally monitored by train drivers

2.7.1 Indication that the level crossing is correctly operating
2.7.1.1 The correct operation of the level crossing equipment shall be indicated on each rail approach to the level crossing using either:
   a) A driver’s level crossing indicator (see GK/RT0045), or
   b) By exception, a proceed signal aspect.

2.7.1.2 Driver’s level crossing indicators shall be positioned either:
   a) Approximately 5 m on the approach to the level crossing, or
   b) At the relevant stop board, where provided.

2.7.1.3 Where a driver’s level crossing indicator is provided and there is also a signal in close proximity to the level crossing, the signalling system shall be designed to avoid any possibility of confusion between the aspect displayed by the signal and the indication displayed by the driver’s level crossing indicator.
2.7.2  Indication of permissible crossing speeds for lines without ETCS level 2

2.7.2.1 All trains shall be required to approach the level crossing not exceeding a defined crossing speed(s).

2.7.2.2 Except where a stop board is provided (see 2.1.4), the crossing speed(s) shall be indicated to the train driver using an automatic level crossing speed restriction sign on each level crossing approach, including wrong direction approaches. Further requirements for automatic level crossing speed restriction signs are set out in GI/RT7033.

2.7.2.3 The automatic level crossing speed restriction sign shall be located at a point from which:

a) The relevant driver's level crossing indicator is visible to the train driver, and
b) The train driver can observe whether the level crossing is clear.

2.7.2.4 The maximum distance from the automatic level crossing speed restriction sign to the level crossing shall be 600 m.

2.7.2.5 The crossing speed(s) applicable to each level crossing approach shall be compatible with the requirement for trains to stop before reaching the level crossing if the train driver cannot confirm that it is safe to pass over the level crossing when the train reaches the automatic level crossing speed restriction sign. Further requirements for spacing of signalling equipment are set out in GK/RT0075.

2.7.2.6 The crossing speed shall not exceed 55 mph.

2.7.2.7 If there is a signal between the automatic level crossing speed restriction sign and the level crossing, a miniature automatic level crossing speed restriction sign shall be provided at the signal as a reminder of the crossing speed.

2.7.3  Provision of level crossing sighting boards for lines with ETCS level 2

2.7.3.1 All trains shall be required to approach the level crossing not exceeding a defined crossing speed(s).

2.7.3.2 Except where a stop board is provided (see 2.1.4) a level crossing sighting board shall be provided on each level crossing approach, including wrong direction approaches. Further requirements for the level crossing sighting board are set out in GI/RT7033.

2.7.3.3 The level crossing sighting board shall be located at a point from which:

a) The relevant driver's level crossing indicator is visible to the train driver, and
b) The train driver can observe the crossing to determine whether or not it is clear.

2.7.3.4 The maximum distance from the level crossing sighting board to the level crossing shall be 600 m.

2.7.3.5 The crossing speed(s) applicable to each level crossing approach shall be compatible with the requirement for trains to stop before reaching the level crossing if the train driver cannot confirm that it is safe to pass over the level crossing when the train reaches the level crossing sighting board. Further requirements for spacing of signalling equipment are set out in GK/RT0075.

2.7.3.6 The crossing speed shall not exceed 90 km/h.
2.7.4 Provision of level crossing warning signs

2.7.4.1 A level crossing warning sign shall be provided on the approach to the special speed restriction sign, level crossing sighting board or stop board. Further requirements for level crossing warning signs are set out in GI/RT7033.

2.7.4.2 The position of the level crossing warning sign shall be compatible with:

a) The requirement for all trains travelling at the permissible speed to stop before reaching the level crossing if the brakes are applied at the level crossing warning sign, and

b) The requirement for all trains to decelerate from the permissible speed to the relevant crossing speed before reaching the automatic level crossing speed restriction sign or level crossing sighting board.

2.7.5 Operation of audible warning devices

2.7.5.1 At all automatic level crossings, the audible warning (see Appendix A) shall commence at the initiation of the closing sequence and continue until all approaching trains have passed clear of the level crossing, and the red road lights have extinguished.

2.7.6 Provision for wrong direction movements

2.7.6.1 The arrangements provided for wrong direction movements shall be the same as those for normal direction movements, including:

a) Determination of crossing speed

b) Provision of automatic level crossing speed restriction signs or level crossing sighting boards

c) Provision of level crossing warning signs

d) Provision of driver's level crossing indicators.

2.7.7 Level crossing resetting functionality

2.7.7.1 Whenever timed resetting of the level crossing is initiated, the driver's level crossing indicator shall extinguish the flashing white light 30 seconds before the level crossing warnings displayed to the road user cease to operate.

2.8 Train crew operation at automatic level crossings

2.8.1 Level crossing initiation plungers and pull cords

2.8.1.1 Where initiation of the closing sequence at an automatic level crossing requires action by the train crew, a level crossing operating device shall be provided (for example a plunger and/or pull cord).

2.8.1.2 The operating device shall only initiate the closing sequence when a train is detected to be present on the relevant approach.

2.9 Identification of level crossings

2.9.1 Level crossing names

2.9.1.1 Each level crossing shall have a locally unique name.

2.9.1.2 Identification signs and labels at the level crossing and in the sectional appendix shall use the locally unique name.
2.9.2 Provision of level crossing identification signs

2.9.2.1 Signs shall be provided to indicate the name of level crossings, both to level crossing users and to railway staff. Further requirements for level crossing identification signs are set out in GI/RT7033.

2.9.2.2 In addition to the crossing name, the signs shall show the national grid reference.

2.9.2.3 Where telephones are not provided, the signs shall also show a contact telephone number.

2.9.3 Provision of level crossing information at signal boxes

2.9.3.1 At every control and supervising point, the signal box diagram shall identify the locations of:

a) All controlled and automatic level crossings within its control area
b) All user worked level crossings with telephones within its control area
c) Any level crossing, whether within or outside the control area of the control or supervising point, from which control or supervision may be transferred by operation of a closing switch at its usual supervising point.

2.9.3.2 Information shall be available (for example, in the form of a list), to enable the signaller to identify the location of all other level crossings in the control area of the signal box, where these level crossings are not shown on the signal box diagram or its equivalent.

2.10 General requirements for telephones at level crossings

2.10.1 Provision of telephones at level crossings

2.10.1.1 Telephones for crossing users at a particular level crossing shall all be of the same appearance and operate in the same way.

2.10.1.2 Additional telephones shall be provided at level crossings where they are required for use by authorised railway staff employed by railway undertakings either during normal operations or during failure of level crossing equipment.

2.10.1.3 At level crossings with road traffic light signals, telephones shall be positioned adjacent to the right-hand side light unit.

2.10.1.4 At level crossings that do not have road traffic light signals, telephones shall be positioned adjacent to the point of access to the railway.

2.10.1.5 Telephones provided for the use of railway staff shall be positioned so that users can safely operate the crossing controls provided while using the telephone.

2.10.2 Provision of telephones at automatic level crossings

2.10.2.1 Telephone communication to the signaller shall be provided at all automatic level crossings that have barriers.

2.10.3 Provision of telephones at level crossings used by railway staff, user worked level crossings and bridleway level crossings

2.10.3.1 Telephone communication to the signaller shall be provided at all level crossings used by railway staff, user worked level crossings and bridleway level crossings where:

a) The warning time is less than the time needed to cross safely, and
b) No active visible warning is provided.
2.10.3.2 Telephone communication to the signaller shall be provided at level crossings where, either:

a) There is known to be regular use by animals on the hoof, or

b) There are more than two running lines.

2.10.3.3 Where telephones are provided at level crossings for users, all of the following shall apply:

a) There shall be at least one telephone on each side of the railway line

b) The telephones shall be clearly visible from the level crossing area

c) The telephones shall be clearly visible from any sign instructing use of the telephone.

2.10.4 Provision of telephones at controlled level crossings with automatic lowering functionality

2.10.4.1 Telephone communication to the signaller shall be provided at all controlled level crossings with automatic lowering functionality where there is known to be regular use by animals on the hoof or slow moving vehicles.

2.10.5 Labelling of level crossing telephones used by members of the public

2.10.5.1 Level crossing telephones shall be clearly signed externally with an identification label to allow a user to identify their function.

2.10.5.2 If any external telephone identification label cannot be clearly seen from all parts of the crossing area, and from any sign instructing users to use the telephone, additional identification labels shall be affixed to the side of the telephone enclosure or its supporting structure.

2.10.5.3 Telephones shall be clearly labelled internally with an information label to instruct the user in their correct use and to give the information likely to be needed in normal and emergency situations.

2.10.5.4 Internal information labels shall provide all of the following:

a) Instructions on how to use the telephone

b) The name of the control point (for example, signal box)

c) The name of the level crossing

d) The national grid reference of the level crossing, accurate to 100 m

e) The public telephone number of a continuously staffed location, to be contacted if the telephone is faulty.

2.10.6 Labelling of level crossing telephones provided for use by railway staff

2.10.6.1 Level crossing telephones shall be clearly signed externally with an identification label to allow railway staff to identify their function.

2.10.6.2 Telephones shall be clearly labelled internally with an information label to instruct railway staff in their correct use and to give the information likely to be needed in normal and emergency situations.
2.1.0.6.3 Internal information labels shall provide all of the following:

a) Instructions on how to use the telephone

b) The name of the control point (for example, signal box)

c) The name of the level crossing

d) The national grid reference of the level crossing, accurate to 100 m

e) The phonetic alphabet.

2.11 Requirements for Automatic Warning System (AWS) at level crossings

2.11.1 Provision of AWS track equipment on lines without ETCS level 2

2.11.1.1 Automatic Warning System (AWS) track equipment shall be provided on the approach to all distant signals, distant boards and level crossing warning signs associated with signalled movements towards automatic level crossings and level crossings operated by train crew.

2.11.1.2 Further requirements for AWS are set out in GE/RT8035.

2.11.2 Provision of AWS track equipment on lines with ETCS level 2

2.11.2.1 AWS track equipment shall not be provided.

2.12 Illumination of level crossings

2.12.1 Provision of lighting

2.12.1.1 A level crossing shall be illuminated if all of the following apply:

a) Safe operation relies on the train driver seeing that the level crossing is clear

b) The level crossing is used by road vehicles

c) Trains run after dark

2.12.1.2 If the road approaches to a level crossing are illuminated, the level crossing shall be illuminated to at least the same standard.

2.12.1.3 Lighting shall not interfere with the visibility of signals or the train driver’s ability to distinguish the signal aspects displayed.

2.12.1.4 Where crossing illumination is provided, it shall not cause glare to the extent that it affects the ability of train drivers to see that the crossing is clear or impair the ability to observe lineside signs and signals after passing over the crossing.

2.13 Sighting requirements for indicators and lineside operational signs

2.13.1 Requirement for sighting

2.13.1.1 Driver’s level crossing indicators, barriers up ‘BU’ indicators and lineside signs provided on the approaches to level crossings shall be sighted in accordance with GE/RT8037.

2.13.1.2 Where the layout of the level crossing is such that a train driver could be misled by lights on the road (including the lights on vehicles), provision shall be made to reduce the risk to an acceptable level.
Level Crossing Interface
Requirements

2.14 Life cycle management of level crossings

2.14.1 Arrangements for train operations during construction

2.14.1.1 If rail services are not suspended during the period of construction, arrangements shall be made to ensure the safe passage of trains.
Part 3  Operational Interfaces at Level Crossings

3.1  Operational interfaces at train crew operated level crossings

3.1.1  Requirements when gates are provided

3.1.1.1  The gates shall be secured across the railway, and the means of unlocking or releasing them to enable them to be closed across the road shall be available only to authorised operators.

3.1.2  Requirements to observe ‘Barriers Up’ indications

3.1.2.1  If a BU indication is not illuminated, it shall be necessary for the train to stop and for a member of the train crew to return to the level crossing to raise the barriers using the control unit.

3.2  Operational interfaces at bi-directional automatic level crossings

3.2.1  Wrong direction controls on unidirectional lines

3.2.1.1  Automatic level crossings provided with wrong direction controls shall be identified in the sectional appendix.

3.3  Investigation of complaints from users of level crossings

3.3.1  Co-operation between the infrastructure manager and railway undertakings

3.3.1.1  Procedures shall be in place to receive complaints from users of level crossings. Complaints shall be investigated to determine any action necessary and the appropriate timescale to provide for continuing safety of the level crossing.
Part 4 Application of this Document

4.1 Application - infrastructure managers

4.1.1 Scope

4.1.1.1 The requirements in Parts 2 and 3 of this document apply to all work that affects level crossing interfaces, as set out in Table 1:

<table>
<thead>
<tr>
<th>Scope of change</th>
<th>Applicable requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provision of a new level crossing</td>
<td>All</td>
</tr>
<tr>
<td>Alteration to the type of level crossing (as defined in Table 2)</td>
<td>All</td>
</tr>
<tr>
<td>Lineside signalling system or ETCS lineside sign alterations</td>
<td>2.1, 2.6 and 2.7</td>
</tr>
<tr>
<td>AWS alterations</td>
<td>2.11</td>
</tr>
<tr>
<td>Alterations to the train crew operational interface with level crossing equipment</td>
<td>2.2, 2.3, 2.4, 2.7, 2.8, 2.9, 2.12 and 2.13</td>
</tr>
<tr>
<td>The user interface at staff level crossings</td>
<td>2.5</td>
</tr>
<tr>
<td>Level crossing name change</td>
<td>2.9</td>
</tr>
<tr>
<td>Level crossing telephone alterations</td>
<td>2.10</td>
</tr>
<tr>
<td>The visibility of locally monitored level crossings</td>
<td>2.12</td>
</tr>
</tbody>
</table>

Table 1 Scope of application

4.1.1.2 It is permissible for the infrastructure manager to designate specific infrastructure projects, ongoing when this document comes into force, for which compliance with the requirements of this document applicable to the design, construction and commissioning of new or altered infrastructure is not mandatory. When designating such projects, the infrastructure manager shall consider:

a) Its responsibilities under its current safety authorisation
b) The stage reached by the project at the time this document comes into force (for example, approval in principle)
c) Whether compliance is necessary to ensure compatibility with other parts of the infrastructure
d) Whether compliance is necessary to facilitate safe interworking, having regard to changes to related requirements mandated on another infrastructure manager or a railway undertaking
e) The economic impact of compliance, but subject to its current safety authorisation in relation to the infrastructure in question.

4.1.1.3 Action to bring existing level crossings into compliance with the requirements of this document is not required.

4.1.2 Exclusions from scope

4.1.2.1 There are no exclusions from the scope specified in 4.1.1 for infrastructure managers.
4.1.3 General compliance date for infrastructure managers

4.1.3.1 This Railway Group Standard comes into force and is to be complied with from 02 March 2013.

4.1.3.2 After the compliance dates or the date by which compliance is achieved if earlier, infrastructure managers are to maintain compliance with the requirements set out in this Railway Group Standard. Where it is considered not reasonably practicable to comply with the requirements, authorisation not to comply should be sought in accordance with the Railway Group Standards Code.

4.1.4 Exceptions to general compliance date

4.1.4.1 There are no exceptions to the general compliance date specified in 4.1.3 for infrastructure managers.

4.2 Application - railway undertakings

4.2.1 There are no requirements applicable to railway undertakings.

4.3 Health and safety responsibilities

4.3.1 Users of documents published by RSSB are reminded of the need to consider their own responsibilities to ensure health and safety at work and their own duties under health and safety legislation. RSSB does not warrant that compliance with all or any documents published by RSSB is sufficient in itself to ensure safe systems of work or operation or to satisfy such responsibilities or duties.
Appendix A  Level Crossing Audible Warning Parameters

The content of this appendix is mandatory

A.1  Sound characteristics

A.1.1  Level crossing audible warning devices shall emit a continuous sound comprising repetition of two alternating tones.

A.1.2  The two alternating tones shall have frequencies of 800Hz (+/-10%) and 1000Hz (+/-10%) and shall be of equal duration.

A.1.3  The tonal sequence shall repeat approximately every 0.5 second.

A.1.4  When a distinctive tone is required to give warning of a second train approaching the level crossing, the tonal sequence shall alternate at an increased rate of rapidity approximating every 0.25 second.
Definitions and Abbreviations

**Authorised level crossing operator**
A person employed by an infrastructure manager or railway undertaking who is specifically authorised to operate level crossing equipment.

**Automatic level crossing**
A level crossing where the warning equipment (for example, barriers and active warnings), is activated automatically by the approaching train. The term excludes a manually controlled crossing where automatic lowering and/or automatic raising of the barriers and/or automatic crossing clear functionality is provided.

**Automatic lowering**
The automatic lowering of the barriers at a manually controlled level crossing, initiated by a train.

**Automatic raising**
The automatic raising of the barriers at a manually controlled level crossing, initiated by the passage of a train clear of the level crossing.

**AWS**
Automatic Warning System.

**Barriers lowered**
The position of level crossing barriers when the road is closed by the level crossing.

**Barriers raised**
The position of level crossing barriers when the road is fully open to allow users to traverse the level crossing.

**Bi-directional controls**
Controls and equipment provided to operate an automatic level crossing correctly when trains approach from either direction on each line, irrespective of whether bi-directional signalling is provided.

**Closing sequence**
The sequence of events, initiated by the signaller or crossing keeper or the approach of a train, which applies the protection to the level crossing to prevent users from crossing the railway.

**Closing switch**
A switch located at a level crossing supervising point which can close while the railway line over the level crossing remains open to train movements. Operation of the switch transfers the level crossing telephones and monitoring circuits to an alternative supervising point. Where the supervising point is a signal box which is provided with a block switch or equivalent for signalling purposes, this device also functions as the closing switch.

**Control point**
The location from which one or more controlled level crossings are operated.

**Controlled level crossing**
A level crossing protected by signals, stop boards or ETCS block markers where the passage of each train is the subject of a specific action by the signaller, crossing keeper or train crew.
Level Crossing Interface

Requirements

Crossing speed
The permissible train speed applying between an automatic level crossing speed restriction sign and an automatic locally monitored level crossing.

ETCS block marker
A sign that marks the end of a movement authority on a line with ETCS level 2.

ETCS level 2
European Train Control System level 2 displays signalling information to the driver using an in-cab display; no lineside signals are provided.

Level crossing
An intersection at the same elevation of a road, footpath or bridleway and one or more rail tracks.

Level crossing area
The portion of the level crossing between the road stop lines on either side of the railway.

Level crossing warning time
The length of time between the start of the warning sequence provided for users and the arrival of the first train at the level crossing.

Movement authority
Permission for a train to run to a specific location as a signalled move.

Opening sequence
The sequence of events, initiated by the signaller or crossing keeper or the train clearing the crossing, which withdraws the level crossing protection, allowing users to cross the railway.

Railway staff (user)
A person employed by an infrastructure manager or railway undertaking, acting in accordance with their duties.

Reset (a level crossing)
The action by the level crossing control system of raising the barriers and extinguishing the road traffic light signals after a time delay, following a train detection malfunction.

RETB
Radio Electronic Token Block.

Shunt entry board
A sign that marks the start of a route that is used for shunting purposes on a line fitted with ETCS level 2.

Strike-in point
The position on the approach to an automatic level crossing at which a train initiates the warning or closure sequence.

Supervising point
The location from which one or more automatic crossings are supervised to ensure that they are working correctly.
Train crew
A railway undertaking employee who is specifically authorised to operate level crossing equipment.

Train crew operated barrier level crossing
A controlled level crossing protected by stop boards where the passage of each train is the subject of a specific action by train crew.

User
A person who uses a level crossing.

For the purposes of Table 1 in Part 4, crossings are categorised by type as set out below:

<table>
<thead>
<tr>
<th>Level crossing type</th>
<th>Acronym</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protected</td>
<td></td>
</tr>
<tr>
<td>Manned crossings with gates</td>
<td>MCG</td>
</tr>
<tr>
<td>Manned crossings with barriers, including CCTV</td>
<td>MCB; MCB(CCTV)</td>
</tr>
<tr>
<td>Crossings with barriers and obstacle detectors</td>
<td>CB-OD</td>
</tr>
<tr>
<td>Automatic half barriers, locally monitored</td>
<td>ABCL</td>
</tr>
<tr>
<td>Automatic open crossings locally monitored</td>
<td>AOCL</td>
</tr>
<tr>
<td>Train crew operated crossings</td>
<td>TMOG; TMOB</td>
</tr>
<tr>
<td>Unprotected</td>
<td></td>
</tr>
<tr>
<td>Automatic half barriers, remotely monitored</td>
<td>AHBC</td>
</tr>
<tr>
<td>Red / green miniature stop light crossings</td>
<td>UWC(MSL); FP(MSL)</td>
</tr>
<tr>
<td>User worked / footpath / bridleway crossings with or without telephone</td>
<td>UWC; FP; BW</td>
</tr>
</tbody>
</table>

Table 2 Types of level crossing
References

The Catalogue of Railway Group Standards gives the current issue number and status of documents published by RSSB. This information is also available from www.rgsonline.co.uk.

Documents referenced in the text

**Railway Group Standards**

- RGSC 01 The Railway Group Standards Code
- GE/RT8035 Automatic Warning System (AWS)
- GE/RT8037 Signal Positioning and Visibility
- GE/RT8270 Assessment of Compatibility of Rolling Stock and Infrastructure
- GI/RT7033 Lineside Operational Safety Signs
- GK/RT0045 Lineside Signals, Indicators and Layout of Signals
- GK/RT0075 Lineside Signal Spacing and Speed Signage

**RSSB documents**

- GK/GN0692 Guidance on Level Crossing Interface Requirements