

Maintenance of Signal Visibility

Signatures removed from electronic version

Synopsis

This document sets out the requirements necessary to ensure that the **visibility** and alignment of signals, and signs that perform the function of signals, are not adversely affected during the life of the equipment.

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Part A

A1 Issue record

Issue	Date	Comments
One	December 2001	Original Document Replaced GK/RT0037 issue 3 section 7

This document will be updated when necessary by distribution of a complete replacement.

A2 Implementation of this document

The publication date of this document is December 2001.

This document comes into force on 2 February 2002.

The dates by which compliance with the requirements of this document is to be achieved are set out in Part B2. Where those dates are later than the date on which this document comes into force, this is to give Railway Group members additional time to plan and commence implementation so as to achieve full compliance by the dates set out in Part B2.

This document supersedes the following Railway Group Standards, either in whole or in part as indicated:

Railway Group Standard	Issue No.	Title	RGS sections superseded by this document	Date(s) as of which sections are superseded
GK/RT0037	3	Signal Sighting	7	2 Feb 2002

A3 Scope of Railway Group Standards

The overall scope of Railway Group Standards is set out in Appendix A of [GA/RT6001](#). The specific scope of this document is set out in Part B2.

A4 Responsibilities

Railway Group Standards are mandatory on all members of the Railway Group* and apply to all relevant activities that fall into the scope of each individual's Railway Safety Case. If any of those activities are performed by a contractor, the contractor's obligation in respect of Railway Group Standards is determined by the terms of the contract between the respective parties. Where a contractor is a duty holder of a Railway Safety Case then Railway Group Standards apply directly to the activities described in the Safety Case.

* The Railway Group comprises Railtrack PLC, Railway Safety, and the train and station operators who hold railway safety cases for operation on or related to infrastructure controlled by Railtrack PLC.

Railtrack PLC is known as Railtrack.

A5 Health and safety responsibilities

In issuing this document, Railway Safety makes no warranties, express or implied, that compliance with all or any documents published by Railway Safety is sufficient on its own to ensure safe systems of work or operation. Each user is reminded of its own responsibilities to ensure health and safety at work and its individual duties under health and safety legislation.

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Railway Group Standard

GE/RT8034

Issue One

Date December 2001

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A6 Technical content

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A7 Supply

Controlled and uncontrolled copies of this document may be obtained from the Industry Safety Liaison Dept, Railway Safety, Evergreen House, 160 Euston Road, London NW1 2DX.

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Part B

B1 Purpose

The purpose of this document is to set out the requirements needed to ensure that the **visibility** and alignment of signals, and signs that perform the function of signals, are not adversely affected during the life of the equipment.

B2 Application of this document

B2.1 To whom the requirements apply

This document contains requirements that are applicable to duty holders of the following categories of Railway Safety Case:

- a) infrastructure controller
- b) station operator
- c) train operator

Under the Railways (Safety Case) Regulations 2000, the duty holder at a station (as defined in those Regulations) is responsible for ensuring that the requirements of Railway Group Standards are complied with. At a station, contractual arrangements (including a lease) do not of themselves relieve the duty holder of his obligations under those Regulations.

B2.2 Compliance requirements

The requirements of this document are mandatory from 2 February 2002. The requirements apply to all existing and new infrastructure. The first cycle of routine inspections, as required by section B5 of this document, shall be completed by 2 February 2003.

Signals, signs that perform the functions of signals, and buffer stop lights, are all within the scope of this document. Hereinafter, these are all referred to as signals.

B2.2.1 Infrastructure controller

Duty holders of this category of railway safety case shall comply with all parts of this document.

B2.2.2 Station operator

Duty holders of this category of railway safety case are required to advise the infrastructure controller of any changes that could affect the **visibility** of signals as specified in section B6. As a consequence, they need to be aware of the contents of sections B6 and B7 of this document.

B2.2.3 Train operator

Duty holders of this category of railway safety case are required to advise the infrastructure controller of any changes that could affect the **visibility** of signals as specified in section B6. As a consequence, they need to be aware of the contents of sections B6 and B7 of this document.

B2.2.4 General compliance requirements

Until the compliance date, or the date by which compliance is achieved (if earlier), the applicable requirements of [GK/RT0037](#) issue three shall continue to be met (see Part A for details).

After the compliance date, or after the date by which compliance is achieved (if earlier), railway group members shall not deviate from the requirements set out in this document.

Where it is considered not reasonably practicable to comply with the requirements set out in this document, authorisation not to comply shall be sought in accordance with [GA/RT6001](#), [GA/RT6004](#) or [GA/RT6006](#).

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B2.3 Related requirements in other documents

Requirements for the positioning of new, modified in form, or repositioned signals are contained in [GK/RT0037](#).

Requirements for the re-assessment of the **visibility** of existing signals following an overrun (**Signal Passed At Danger** – SPAD) are contained in [GO/RT3252](#).

Requirements for the management of gauging and clearances to signals are contained in [GE/RT8029](#).

Requirements for the inspection and management of structures supporting signals are contained in [GC/RT5100](#).

B2.4 Supporting documents

There are no Railway Safety RACOPs or Guidance Notes that support this document.

B3 Definitions

Alignment

The horizontal and vertical relationship between the centre-line of an element and the railway infrastructure.

Element

An element of a **signal** is any of the following:

- a) a single aspect of a main **signal** (a double yellow counts as two elements)
- b) a position light junction indicator
- c) the number/character displayed by an alphanumeric route indicator
- d) a single arm/disc of a semaphore **signal** or, during darkness, the illuminated spectacle plate
- e) an aspect of a position light **signal**.

In the vicinity of signals

Any object or source of light within the railway boundary and within 400 m of a **signal**.

Platform starting **signal**

A **signal** is defined as a platform starting **signal** if either:

- a) the longest passenger (or empty coaching stock) train authorised to use the platform would, if stopped at the **signal**, still have a portion of the passenger accommodation alongside the platform, or
- b) the leading end of the train passes over the Automatic Warning System (AWS) equipment associated with the **signal** before it is dispatched from the station.

It is also permissible to define any other **signal** as being a platform starting **signal** where it is operationally beneficial to do so even though it does not meet the criteria above.

Required reading time

The required reading time is the sum of:

- a) the time that is essential in order for a driver approaching a **signal** to:
 - i) identify the **signal** as being applicable to the driver
 - ii) observe the information presented by the **signal**

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- iii) interpret the information to determine what action, if any, is required
- b) such additional reading time as is reasonably practicable to provide

Both parts a) and b) of the required reading time are specific to each individual **signal**.

B4 Processes required

This document requires the following processes to be put in place:

- a) A regular program of inspections of signals as detailed in section B5.
- b) Procedures for identifying and controlling changes in the vicinity of signals that could affect a **signal's visibility** as detailed in section B6.
- c) Procedures that ensure that reports of deficiencies or changes in the vicinity of a **signal**, result in appropriate assessments and remedial work as detailed in section B7.

All these processes shall be documented by the duty holders.

B5 Routine inspections

B5.1 Inspections

The infrastructure controller shall ensure that every **signal** is regularly inspected (see section B5.2) to verify that the **visibility** and alignment have not been adversely affected. This includes consideration of factors which require action to prevent them adversely affecting **visibility** in the future.

Inspections shall include checks of:

- a) the alignment of elements
- b) the **visibility** of the **signal** throughout the required reading time
- c) the relative position of the elements and associated signs/labels
- d) the close-up viewing of the **signal** (see [GK/RT0037](#))
- e) evidence of ground settlement affecting the **signal** structure
- f) factors such as cleanliness, lamp voltage, or ageing of components, that can reduce readability
- g) interruptions to the view, such as could be caused by changes in vegetation
- h) lack of clarity from the background
- i) distracting lights
- j) sunlight.

For signals designated as platform starting signals (see [GK/RT0037](#)), inspections shall additionally ensure that the **signal** (or banner/OFF indicator) is readable by train dispatch staff, including (where appropriate) a guard positioned in a train.

Inspections shall be carried out by a combination of trackside inspections and observations from train driving cabs.

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Where **signal sighting** committee records exist, these shall be used to confirm the correctness of the details listed in this section. Where photographs of the **signal** as installed (or last modified) exist, these shall be used to verify the relative position of the elements and associated signs/labels and the available reading distance.

Where the original records of the **signal sighting** committee are not available, the infrastructure controller shall provide replacement details providing sufficient information for the inspections required in this section to be carried out.

Observations from the cab shall be conducted both during daylight hours and at night. Where known or anticipated problems exist which only occur at certain times of the day or year (eg phantom aspects caused by low sun), observations shall be timed to coincide with these events.

B5.2 Frequency of inspections

The infrastructure controller shall set frequencies for inspections. In all cases they shall not be less frequent than annual. Where necessary, more frequent inspections shall be undertaken for specific sections of line or during specific periods, such as when construction work is taking place.

B5.3 Competences

The infrastructure controller shall set and ensure enforcement of competence standards for staff carrying out inspections described in this section B5.

B6 Changes in the vicinity of signals

B6.1 General requirements

The **visibility** of signals can be adversely affected by changes to the environment in the vicinity of the signals.

Railway group members shall advise the infrastructure controller at the earliest practicable opportunity of proposed changes, so that the effect of the change to the **visibility** of signals can be assessed. Planned changes shall not take place until agreement has been reached to safeguard the **visibility** of signals. These requirements apply to both temporary and permanent changes.

When assessing the acceptability of a proposed change, the following rules apply:

- a) Where the **visibility** of the **signal** is fully compliant with the current version of **GK/RT0037**, then the change shall not introduce any non-compliance.
- b) Where the **visibility** of the **signal** is not compliant with the current version of **GK/RT0037**, then the change shall not worsen the degree of non-compliance.

Where a railway group member becomes aware that the **visibility** of a **signal** has been adversely affected, they shall advise the infrastructure controller at the earliest practicable opportunity so that remedial action can be taken.

B6.2 Buildings and structures

When a railway group member is responsible for any new or altered structural design, they shall advise the infrastructure controller of any alterations planned to take place in the vicinity of signals so that the potential affect on **signal visibility** can be assessed. This shall include the provision of a new **signal** structure which could itself adversely affect the **visibility** of an existing **signal**.

When a railway group member becomes aware of any structural design work that is outside the control of railway group members and that has the potential to affect **signal visibility**, they shall advise the infrastructure controller in writing of the alterations.

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The design requirements for structures are set out in [GC/RT5110](#).

B6.3 Light pollution

Alterations to lighting in the vicinity of signals can cause distraction or create confusion when seen by an approaching train driver.

A railway group member planning lighting alterations in the vicinity of signals shall advise the infrastructure controller so that the potential affect on **signal visibility** can be assessed.

When a railway group member becomes aware of any lighting alterations that are outside the control of railway group members that have the potential to effect **signal visibility**, they shall advise the infrastructure controller in writing of the alterations.

B6.4 Line speed increases

The infrastructure controller shall ensure that each **signal** that is subject to an increase in permissible speed on its approach is assessed in accordance with section B6.1 (see also [GK/RT0007](#) and [GI/RT7006](#)).

This section shall also apply to the introduction of, or increase in, enhanced permissible speeds where observation of fixed signals is necessary.

B6.5 Overhead line equipment alterations

Overhead line equipment in the vicinity of signals can cause distractions or short duration interruptions of the **signal** when seen by an approaching train driver.

The infrastructure controller shall ensure that the potential affect on **signal visibility** is assessed when overhead line equipment alterations are planned to take place in the vicinity of signals.

Where emergency alterations have to be carried out, arrangements shall be made for an assessment of the effect on **signal visibility** to be carried out as soon as reasonably practicable thereafter.

B6.6 Rolling stock changes

The infrastructure controller and train operator shall ensure that, as a part of the route acceptance process, an assessment is performed of the **visibility** of signals on the route as seen from the normal driving position of the train. The assessment shall include consideration of the ability of the driver to view signals from close proximity, as might be experienced at station platforms.

Where train dispatch is carried out by the guard from within the train, an assessment of any platform starting **signal** (or banner/OFF indicator) visible from all possible positions of the guard shall also be performed.

B6.7 Stopping positions of trains

A railway group member proposing an alteration to the stopping positions of trains at stations shall perform an assessment of platform starting **signal visibility** as seen from the normal driving position of the train. In particular, the assessment shall consider the ability of the driver to view signals when the train is stopped close to the **signal**.

Where train dispatch positions are altered (including guards within the train), an assessment of any platform starting **signal** (or banner/OFF indicator) visible from the revised dispatch positions shall also be performed.

Alterations at a station that could affect **signal visibility** are set out in [GC/RT5161](#).

B6.8 Vandalism

The infrastructure controller shall provide anti-vandalism measures to protect signals whose **visibility** could otherwise be adversely affected. The anti-vandalism measures shall not themselves significantly affect the **visibility** of the **signal**.

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B6.9 Vegetation

The infrastructure controller shall ensure that vegetation growth is managed so as to maintain the **visibility** of the **signal**. Management requirements for the control of risks that arise due to the presence of vegetation are set out in [GC/RT5202](#).

The control of vegetation shall, as far as reasonably practicable, ensure that **signal visibility** is still adequate during strong winds or when substantial quantities of snow accumulate on vegetation.

B6.10 Other railway infrastructure operators

The infrastructure controller shall ensure that where other railway operators have infrastructure that runs alongside or close to Railtrack controlled infrastructure, the risks associated with drivers misreading signals on either system are acceptably low.

The infrastructure controller shall ensure that the infrastructure controller for the neighbouring railway is advised of the issue and that action is taken to maintain **signal visibility**.

B7 Reporting and assessment process

The reporting and assessment process mandated in the following section is shown diagrammatically in Appendix A.

B7.1 Requirement for co-ordination

Railway group members shall report deficiencies and planned changes in **signal visibility** to the infrastructure controller, who shall co-ordinate all such reports. These reports shall include, but not be limited to:

- a) changes that could adversely affect **signal visibility** (see section B6)
- b) train driver observed defects (other than those identified in the Rule Book section C)
- c) deficiencies identified during routine inspections (other than those requiring like for like component replacement)
- d) reports of deficiencies or potential deficiencies from other sources.

Each railway group member shall co-ordinate their reporting such that the infrastructure controller receives reports from designated persons only.

B7.2 Initial assessment

The infrastructure controller shall arrange for all reports received regarding proposed changes to, or deficiencies in, **signal visibility** to be initially assessed by a person competent in the requirements of [GK/RT0037](#).

This initial assessment shall review the information provided in order to determine whether a **signal sighting** committee is required to make a detailed assessment of the affected **signal(s)**. When necessary to complete this assessment, site visits, consultation with the originator or a review of previous **signal sighting** committee recommendations shall be undertaken.

The results of the initial assessment shall be one of the following:

- a) No work is required because **signal visibility** is not affected in any way.
- b) Agreement with the originator has been reached such that the proposed change can be modified to avoid adversely affecting **signal visibility**.
- c) A full **signal sighting** committee needs to be arranged to assess in detail the consequences of the proposal or report, and to recommend appropriate remedial work.

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If the initial assessor is in any doubt, then option c) shall be selected.

B7.3 Assessment by Signal Sighting Committee

The infrastructure controller shall ensure that, where required by section B7.2, a **Signal Sighting** Committee is arranged to assess a proposed change of, or a reported deficiency in, **signal visibility**. The originator of the proposal/report, or their representative, shall be invited to attend where this is considered likely to improve the decision making process.

In respect of remedial work associated with signals that are the subject of a deficiency report, consideration shall be given to implementing those technical requirements set out in [GK/RT0037](#), which are both reasonably practicable in the circumstances, and have the potential to reduce the risk of a **signal** being passed at danger in the future.

B7.4 Feedback and monitoring

The infrastructure controller shall be responsible for co-ordinating the feedback of the conclusions arising from all assessments, to the originating railway group member. This information shall be forwarded to the report originator.

The infrastructure controller shall ensure that copies of correspondence relating to reports of deficient **visibility** are passed to all train operating companies who operate over the affected line.

B7.5 Planned work

The infrastructure controller shall ensure that the proposed actions resulting from the assessments are carried out. Work to maintain the **visibility** of signals shall be completed before any planned changes take place.

B7.6 Remedial work

Remedial work needed to rectify **visibility** that has already become defective shall be completed as soon as is reasonably practicable. The infrastructure controller shall consider the need for temporary measures, such as a reduction in permissible speed, to improve **visibility** until the remedial work is complete.

The infrastructure controller shall implement a process to monitor rapid response actions arising from reports of **signal visibility** defects to confirm that the deficiencies have been adequately resolved.

B8 Records

B8.1 Inspections

The infrastructure controller shall retain all **signal sighting** details and photographs needed to carry out the routine inspections detailed in section B5. Copies shall be made available to those carrying out the inspections.

The infrastructure controller shall ensure that those undertaking maintenance keep records of all inspections required in section B5.

B8.2 Reports and assessments

The infrastructure controller shall keep records of all reports received of **signal visibility** deficiencies and of changes affecting the **visibility** of signals.

The infrastructure controller shall keep records of assessments and remedial work made as a result of reports received. These shall include details of any temporary measures required in section B7.5 or B7.6 or the reasons why temporary measures were considered but not required.

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Appendix A

Signal visibility deficiencies – reporting process

(The contents of this Appendix are advisory rather than mandatory)

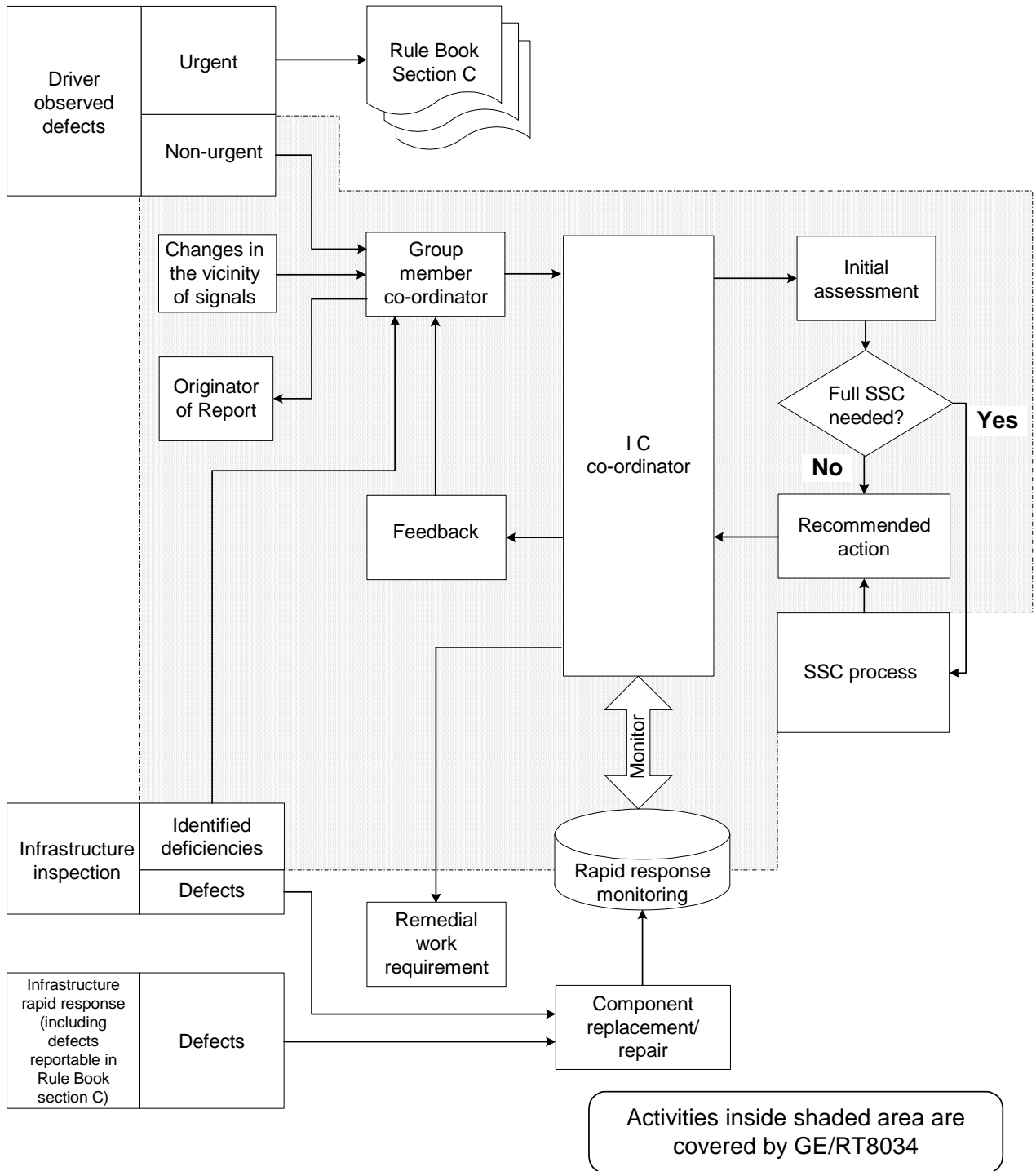


Figure 1. Signal visibility deficiencies – reporting process

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References

Railway Group Standards and other Railway Group Documents

GA/RT6001	Railway Group Standards Change Procedures
GA/RT6004	Temporary Non-Compliance with Railway Group Standards
GA/RT6006	Derogations from Railway Group Standards
GC/RT5100	Safe Management of Structures
GC/RT5110	Design Requirements for Structures
GC/RT5161	Station Design and Maintenance Requirements
GC/RT5202	Vegetation-Managing the Risks
GE/RT8029	Management of Clearances and Gauging
GI/RT7006	Prevention and Mitigation of Overruns – Risk Assessment
GK/RT0007	Alterations to Permissible Speeds
GK/RT0037	Signal Positioning and Visibility
GO/RT3252	Signals Passed at Danger (SPADs)

The Catalogue of Railway Group Standards and the Railway Group Standards CD-ROM give the current issue number and status of documents published by Railway Safety.