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Rail Industry Standard for Lighting at Stations

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Rail Industry Standard for Lighting at Stations

Issue record

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Superseded or replaced documents

The following Railway Group documents are superseded or replaced, either in whole or in part as indicated:

Superseded documents	Sections superseded	Date when sections are superseded
RIS-7700-INS, issue one, December 2007 Rail Industry Standard for Station Infrastructure	Part 6	01 June 2013
GI/GN7520, issue one, December 2007 Guidance on Lighting of Railway Premises	2.2, 2.3, 2.4, 2.5, 2.6 2.7, 2.8, 2.9 2.10, 2.11	01 June 2013

Other parts of RIS-7700-INS, issue one, are superseded by RIS-7700-INS, issue two, Rail Industry Standard for Lighting at Stations.

RIS-7700-INS, issue one, ceases to be in force and is withdrawn as of 01 June 2013.

Other parts of GI/GN7520, issue one, are not superseded by RIS-7702-INS, issue one, Rail Industry Standard for Lighting at Stations.

GI/GN7520, issue one, ceases to be in force and is withdrawn as of 01 June 2013.

Supply

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Part 1 Introduction

1.1 Purpose of this document

- 1.1.1 This document provides a standard on lighting at stations, for the infrastructure managers responsible for managing and operating stations, to use if they so choose.
- 1.1.2 This document has been derived from requirements and information set out in the following documents:
 - a) RIS-7700-INS Rail Industry Standard for Station Infrastructure.
 - b) GI/GN7520 Guidance on Lighting of Railway Premises.
 - c) The Network Rail Managed Stations Manual.

1.2 Related requirements in other documents

- 1.2.1 This document has been supplemented with references to relevant requirements and guidance that are set out in the following documents / organisations:
 - a) Accessible Train Station Design for Disabled People: Code of Practice (November 2011).
 - b) The Persons with Reduced Mobility Technical Specification for Interoperability (PRM TSI).
 - c) GI/RT7016 Interface between Station Platforms, Track and Trains.
 - d) Building Regulations.
 - e) British Standards (BSs).
 - f) Euronorms (ENs).
 - g) Chartered Institution of Building Services Engineers (CIBSE).
 - h) The Institution of Lighting Professionals (ILP).
- 1.2.2 It is intended to be a document which provides station project teams with a single reference document for identification of the standards and guidance documents required for the planning, design, operation and maintenance of lighting installations, and the selection of lighting levels at stations.
- 1.2.3 This document sets out requirements for lighting at stations including railway-specific aspects such as lighting of platforms, track crossings and ticket barriers and gates, and also non railway-specific elements covering other parts of the station. Lighting requirements for non-railway specific elements such as car parks for example, are provided as guidance.
- 1.2.4 The document has four parts and three appendices that contain requirements and guidance relating to specific aspects of lighting provisions at a station, and is set out as follows:
 - a) Part 2 requirements for planning of lighting installations, relates to the considerations for planning and environment that permit the project brief to be developed in advance of detailed design, installation, operation and management, of lighting to be used at stations.
 - b) Part 3 requirements for lighting design, relates to the general and specific design requirements for lighting to be used at stations.
 - c) Part 4 guidance on installation and commissioning of lighting, relates to the installation and commissioning of lighting to be used at stations.

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- d) Part 5 guidance on operation, maintenance and management of lighting, relates to the on-going, day-to-day operation, maintenance and management of lighting to be used at stations.
- e) Appendix A illuminance levels, sets out the source of illuminance levels for internal and external areas of stations.
- f) Appendix B station categories, sets out the station categorisation systems, which are commonly adopted in industry standards.
- g) Appendix C engineering assurance procedure, sets out the engineering assurance procedures for Building and Civil Engineering Works.

1.3 Application of this document

- 1.3.1 A member of Rail Safety and Standards Board (RSSB) may choose to adopt all or part of this document through company procedures or contract conditions. Where this is the case the member of RSSB will specify the nature and extent of application.
- 1.3.2 Specific compliance requirements and dates have therefore not been specified since these will be the subject of the internal procedures or contract conditions of the companies which choose to adopt this standard.

1.4 Health and safety responsibilities

- 1.4.1 Users of documents published by Rail Safety and Standards Board (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.

1.5 The structure of this document

- 1.5.1 This document is set out as a series of requirements, in some cases followed by relevant guidance. The guidance is indicated by prefixing the paragraph number with the letter 'G'.

1.6 Copyright

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1.7 Approval and authorisation of this document

- 1.7.1 The content of this document was approved by Infrastructure Standards Committee on 06 March 2013.
- 1.7.2 This document was authorised by RSSB on 24 April 2013.

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Part 2 Requirements for Planning of Lighting Installations

2.1 Planning considerations

2.1.1 The specifications for lighting at stations shall take account of the potential for adverse impact on railway operational systems, and also the impact of existing or proposed lighting on premises adjacent to railway stations.

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| G 2.1.1.1 | The process for determination of the lighting specifications should take account of the planning and regulatory framework that applies to stations. |
| G 2.1.1.2 | Good lighting at stations enhances the appeal of public transport and gives passengers a feeling of comfort and security. |
| G 2.1.1.3 | Good lighting does not adversely impact on signal sighting or the readability of signage. It enhances the ability to safely despatch trains, and also enhances the quality of CCTV images for both train despatch and surveillance. |
| G 2.1.1.4 | Lighting installation schemes are subject to engineering assurance procedures as set out in Appendix C. |
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2.1.2 Consultation with affected parties, including those with responsibility for the safe operation of the station, and owners of adjacent premises, shall be undertaken at an early stage in the project.

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| G 2.1.2.1 | When assessing the appropriate levels of illumination required, consideration should be given to: <ul style="list-style-type: none"> a) Local town planning requirements. b) Heritage issues including, English Heritage, the Welsh Government Historic Environment Service (Cadw), and Historic Scotland. c) Listed building status. d) The needs of disabled, mobility and / or sensory impaired persons. e) The impact on people and businesses close to or in the station. f) The impact on adjacent transport systems. |
| G 2.1.2.2 | Consideration should be given to the aesthetics of the building when planning the positioning of luminaires and the luminaire styles, especially for railway premises that are more than 100 years old or of special architectural quality or merit. |
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2.1.3 The lighting provided at railway stations shall not conflict with the warning indications provided for safety or operation of transport systems including the railway.

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| G 2.1.3.1 | Guidance on the provision of a luminous environment and for distribution of illuminance for the performance of visual tasks is set out in sections 4.1 and 4.2 of BS EN 12464-1:2011 and BS EN 12464-2:2007, for interior and exterior environments respectively. |
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- 2.1.4 The planned lighting system shall take account of the users of the station including, passengers, train crew, station and maintenance staff. The lighting system design shall consider the tasks which are being undertaken which include passengers boarding and alighting from trains, passengers and staff reading information, station staff dispatching trains and driver only operation.

2.2 Environmental considerations

- 2.2.1 There are no railway specific requirements for environmental considerations.

- G 2.2.1.1 The environmental impact of lighting installations on the station environment should be assessed (for example, the effect on neighbouring properties or bats). Further information is available from 'Statutory Nuisance from Insects and Artificial Light', published by the Department for Environment, Food and Rural Affairs (DEFRA) and 'Bats and Lighting in the UK', published by the Bat Conservation Trust and the ILP.
- G 2.2.1.2 Local conditions are also a factor to be considered during the initial stages of planning. For example, a minor country station is likely to have little or no adjacent lighting whilst terminal stations are in city centres adjacent to well-lit streets.
- G 2.2.1.3 The Environmental Protection Act 1990 and the various amendments to its clauses as imposed by the Clean Neighbourhoods and Environment Act 2005, establishes the duty of local authorities to undertake inspections in their area to detect cases of statutory nuisance arising from artificial light and to investigate complaints of statutory nuisance arising from persons living in their area. Where a local authority is satisfied that a statutory nuisance exists, an abatement notice will be served. Currently, artificial light emanating from railway premises is exempt from these provisions. Despite this, it is considered to be good practice to identify potential adverse impacts arising from station lighting. Consultation with affected parties is required in 2.1.2.
- G 2.2.1.4 Measures for the elimination or mitigation of the adverse effects of lighting at stations should be identified. These measures include the installation of full cut off lighting (down lighting) in car parks to reduce the effect on neighbouring properties.
- G 2.2.1.5 Energy consumption should be considered at an early stage of the development of lighting installation proposals. The energy standards for light sources are set out in Part L of the Building Regulations.
- G 2.2.1.6 The European Directive 2005/32/EC, for energy-using products (EuP) and the Ecodesign Directive 2009/125/EC for energy-related products (ErP) established a framework for the setting of ecodesign requirements for lighting products.
- G 2.2.1.7 The lighting product sector has been further affected by EU Commission Document No 347/2010, which sets out requirements for the ecodesign of lamps and associated equipment, such that regulations have been drawn up regarding the minimum requirements of lighting equipment and the planned withdrawal of certain types of lamp and its associated control equipment. The ILP has published a document entitled 'Guidance on Current and Forthcoming Legislation within the Lighting Sector' that can be downloaded from their website (www.theilp.org).

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- G 2.2.1.8 Part L of the Building Regulations requires buildings to use fuel and power efficiently. Some parts of railway stations cannot however be designed according to the guidance given in Approved Document L2A, because they are not within scope of the buildings for which simplified energy efficiency models are available. Alternative means of compliance should therefore be demonstrated by the designer by, for example:
- a) Using energy-efficient equipment.
 - b) Providing controls, manual or automatic, to enable lighting equipment to be turned off or dimmed when full output is not required. Manual controls should be accessible to those who need to use them and should be clearly labelled.
 - c) Making provision for proper testing and commissioning of the installation to ensure that it uses no more fuel and power than is necessary in normal use.
 - d) Providing good information regarding the use, operation and maintenance of the lighting equipment to the owner / operator of the infrastructure to permit efficient use of energy.
- G 2.2.1.9 The 'Guidance Notes for the Reduction of Obtrusive Light' published by the ILP, may be a useful source of information. Obtrusive light is commonly referred to as light pollution.
- G 2.2.1.10 Guidance on the requirements for energy efficiency of lighting installations is set out in BS EN 12464-1:2011 clause 4.11 for interior lighting and in BS EN 12464-2:2007 clause 4.10 for exterior lighting.
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Part 3 Requirements for Lighting Design

3.1 General lighting design

3.1.1 Requirements for the design of platform lighting are set out in GI/RT7016, the PRM TSI and the Department of Transport's (DfT's) Accessible Train Station Design for Disabled People: Code of Practice. The DfT Code of Practice (November 2011) provides requirements, advice and recommendations for people with disability at other parts of the station in addition to platforms. Higher levels of illumination may be desirable for visually impaired passengers.

3.1.2 This document (RIS-7702-INS) does not set out requirements for illuminance levels other than at station platforms. The illuminance requirements for other parts of a station are set out in the European or National Standards listed in Appendix A. These standards shall be used as the basis for determination of the required illuminance levels for visual tasks within the station environment. Additional guidance to that contained in referenced documents is provided in this document, and relevant CIBSE and ILP documents where referenced.

G 3.1.2.1 The European or National Standards listed in Appendix A may also be appropriate for platforms where lighting levels in excess of the minimum levels specified in GI/RT7016 are considered to be appropriate (see G 3.2.1.1 and G 3.2.1.3). The required lighting level should be based on an assessment of the requirements of the specific visual task

3.1.3 Requirements and guidance for emergency lighting at stations are set out in section 3.6.

G 3.1.3.1 CIBSE is a recognised authority on lighting and produces a number of documents giving facts, good practice and information on EU directives and reference to national legislation on lighting matters (see <http://www.cibse.org>). The CIBSE Lighting Guide for Outdoor Environments contains a recommended design calculation method which allows for surface deterioration, luminaire cleaning and lamp changing. The CIBSE documents are regularly updated and are considered a useful source of information on lighting matters. Those of particular relevance to the lighting of railway stations include, 'Chartered Institution of Building Services Engineers and The Society of Light and Lighting, 1992' and 'Lighting Guide 12 Emergency lighting design guide, The Chartered Institution of Building Services Engineers and The Society of Light and Lighting'. All CIBSE lighting guidance is now published by the Society of Light and Lighting.

G 3.1.3.2 The Society of Light and Lighting (SLL) 'Code for Lighting:2012' provides recommended calculation methods for indoor and outdoor environments.

G 3.1.3.3 The ILP is an internationally recognised authority on both Exterior and Interior lighting. The ILP publishes Professional Lighting Guides (PLG) on most areas of lighting. These PLGs give recommendations for design and installation of lighting based on best practice, international and national research. In addition to this the ILP website contains a number of freely available downloads dealing with European legislation on tertiary lighting as well as documents relating to environmental and carbon reduction issues. The website is accessed at www.theilp.org.

G 3.1.3.4 The Construction Industry Research and Information Association (CIRIA) document C710 'Addressing crime and disorder in public places through planning and design' provides useful advice about the design and planning issues that arise from the area of "crime and disorder".

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- G 3.1.3.5 Appendix B of this document contains a comparison of typical station categorisation systems used within RGSs and the Network Rail Managed Stations Manual. These categories have been provided for information as they are in common use. However, the lighting levels required for the performance of particular visual tasks at stations depends on the physical characteristics, level of usage, and staffing levels of the station. The lighting level should be based on an assessment of the requirements of the specific visual task. It could be the case that different lighting levels are required for stations of the same category according to Appendix B.
- G 3.1.3.6 The design of lighting installations, and the provision of equipment, for railway stations, should take account of:
- a) The reliability and availability of the illuminance levels to be achieved.
 - b) The type and location of luminaires to be provided, particularly on platforms.
 - c) The potential for interference with the driver's line of sight including the use of driver only operation (DOO) equipment.
 - d) The effect of glare from luminaires.
 - e) The potential for lighting equipment to be mistaken for signals.
 - f) The variability of lighting on the alertness of personnel undertaking safety critical tasks at all times of day when required.
 - g) The potential for overspill (light pollution) onto adjoining property.
 - h) The ground conditions or the structural characteristics of existing structures, for their ability to support any columns or masts.
 - i) The needs of disabled, mobility and / or sensory impaired persons.
 - j) The impact on CCTV systems where provided.
 - k) The need for possessions or isolations during installation and maintenance.
 - l) The energy demands of the lighting installation.
 - m) The whole life cycle costs of the lighting solutions.
 - n) The need for automatic control of lighting installations.
 - o) The need for general lighting, emergency lighting and the requirements of lighting for other purposes.
 - p) The opportunity to make use of natural light.
 - q) The environmental impact of the railway environment on lighting, in particular to consider electromagnetic compatibility, safety bonding, vibration and airborne detritus.
- G 3.1.3.7 The lighting specifications at stations should consider:
- a) Physical, architectural, and functional characteristics (for example, terminal or minor station).
 - b) Location (for example, urban or rural).
 - c) The degree of vehicular and passenger traffic using the station.
 - d) The station staffing levels.

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| G 3.1.3.8 | Wherever possible access for maintenance should be incorporated into the lighting design. |
| G 3.1.3.9 | The use of artificial light should be kept to a minimum. Public buildings should be designed to make use of natural lighting, although care should be taken to minimise glare and strong reflections from surfaces. |
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| 3.1.4 | The lighting provided at railway stations shall be designed to minimise the need for maintenance tasks that require persons to:

a) Go on or near running lines.

b) Take an isolation of the traction electrification system. |
| 3.1.5 | An assessment of the maintainability shall be performed as part of the design. |
| 3.1.6 | Except for platforms, there are no railway specific mandatory requirements for provision of lighting where CCTV systems are in use (see 3.8.7). |
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| G 3.1.6.1 | The ILP and Association of Chief Police Officers joint publication 'Lighting against Crime', gives recommended lighting levels for CCTV. |
| G 3.1.6.2 | The design should account for any existing or known proposed CCTV installation with luminaires selected and positioned to ensure that they do not have a detrimental effect on the CCTV coverage. |
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| 3.1.7 | Where daylight-linked lighting controls are provided, they shall be adjustable and positioned to minimise the risk of incorrect operation due to interference from lighting outside the railway property. |
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| G 3.1.7.1 | Lighting controls may be single photo-electric control units (PECUs) for individual luminaires, or remote PECUs and contactor switching. |
| G 3.1.7.2 | The PECUs should be capable of switching on the power to lighting circuits when ambient lighting levels are below the required level. A single PECU may be used to control the whole platform lighting installation but for larger installations multiple PECUs should be used to ensure correct control of different areas and to provide system redundancy. In order to cater for local conditions (for example, where there are long canopies / structures), care should be taken in locating the PECU / PECUs to ensure that all sections of lighting are controlled under all expected conditions of ambient light. Illuminated footbridges should be considered for separate control where issues of lighting pollution arise. |
| G 3.1.7.3 | A more recent method of light control is to install a central management system (CMS) for the lighting. There are a number of these systems available some of which operate using the Global System for Mobile Communication (GSM) and some of which operate using the power line system (via the electricity mains cable). The CMS is capable of giving total control of the lighting system to the operator and can incorporate variable lighting levels, information regarding the lamp condition and the ability to switch off either totally or by selecting particular lighting units. CMS can be controlled from a computer (desktop or mobile laptop) and developments are in process to allow the use of smart mobile phones in there operation. |
| G 3.1.7.4 | Time clocks (for example solar dial type) can be used at locations that require lighting to be switched off when the station is closed. The time clocks should be installed in series with the PECU circuit to switch off the power to the lighting circuits after the last train has run (with acceptable delay) and switch on again at a predetermined time before the first train runs. |
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- G 3.1.7.5 Where there is a need to switch on the lighting or to carry out maintenance at unstaffed stations with automated switching, arrangements should be put in place through the station management procedures.
- G 3.1.7.6 Consideration of the warm-up time for luminaires, where necessary, should be taken into account when setting the design minimum for the switch-on point of installations that adopt automatic control of lighting.
- G 3.1.7.7 Consideration of lighting requirements should include the need for temporary lighting that is installed for specific tasks or as a replacement to permanent lighting. This is applicable to engineering worksites, when the railway continues to operate at or close to the site of the temporary lighting.
- G 3.1.7.8 Where temporary lighting does not meet the requirements in this document, special working arrangements that address the specific safety hazards of the temporary lighting should be addressed. These arrangements could include, for example, instructions to drivers, clear boundary descriptions, and the provision of specific instructions and notices for distribution and display to all persons affected by the temporary scheme.
- G 3.1.7.9 Additional information for general lighting design is available from the following documents:
- a) Accessible Train Station Design for Disabled People: Code of Practice Part H1 and J1.
 - b) BS 8300:2009 clause 9.4.
 - c) BS EN 5489-1:2013.

3.1.8 Engineering assurance of designs for lighting installations shall be based on the procedure set out in Appendix C.

3.2 Illuminance

3.2.1 The average maintained illumination levels for specific visual tasks at locations within stations shall be based on the values determined in Appendix A.

- G 3.2.1.1 When considering the lighting needs at a specific station it is necessary to make provision in accordance with the required minimum mandatory lighting levels (as set out in GI/RT7016 for platforms) and also to establish appropriate lighting levels for specific visual tasks based on the recommended lighting levels set out in European and National standards (see Appendix A). Specific visual tasks can demand a higher level of illuminance than the minimum mandatory level.
- G 3.2.1.2 The safety of passengers and staff using the station involves the need to move around the station safely in different circumstances (for example, during normal use or when evacuating the station in an emergency).
- G 3.2.1.3 GI/RT7016 and other documents (such as the Accessible Train Station Design for Disabled People: Code of Practice) specify minimum levels of illuminance. The minimum levels of illuminance may not be the most appropriate for levels of comfort, security and safety in all circumstances. They should only be applied as a minimum for the required maintained illuminance level. The circumstances at a particular station may demand higher levels of illuminance and this should be established early in the planning stage of a lighting installation project.
- G 3.2.1.4 The particular specifications for lighting at stations are dependent upon not only the visual task that is necessary, but also whether the station is wholly or partially enclosed.

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- G 3.2.1.5 Relevant European and National Standards which specify requirements for illuminance are:
- a) PRM TSI.
 - b) BS 8300:2009.
 - c) 5.3 of BS EN 12464-1:2011 for interior areas, tasks and activities.
 - d) 5.3 of BS EN 12464-2:2007 for exterior areas, tasks and activities.
 - e) 10.6, 10.7 and 12.3 of BS EN 5489-1:2013.
 - f) BS 5266-1:2011.
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- 3.2.2 The lighting levels specified in this document shall be based on the 'maintained illuminance principle'.
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- G 3.2.2.1 The design calculations for the station lighting should be based on a method (see 3.1.3.1 and 3.1.3.2), which allows (where appropriate) for surface deterioration, luminaire cleaning and lamp changing.
- G 3.2.2.2 A gradual change in illumination should be provided where there are adjacent areas with differing illumination levels, in order to avoid rapid adaptation of the eye.
- G 3.2.2.3 The relative brightness of surfaces should be taken into account when calculating the illuminance values. In order to maintain the required relative brightness it will be necessary to consider the maintenance regime for cleaning of surfaces.
- G 3.2.2.4 When undertaking lighting design calculations for horizontal areas at floor level, a border zone should be excluded from the total area taken into account for illuminance prediction. The border zone should extend 0.5 m from walls, partitions, columns, pillars and other permanent obstructions. The reason for this is to discourage excessive lighting which could arise where border areas are in shadow. On platforms, the platform edge itself should be included in the calculated area and should not be considered as a border zone.
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- 3.2.3 The determination of the level of illuminance shall not include lighting spillage from retail units in any design calculations. No reliance is to be made on lighting spillage from retail units as they have a frequent change of use.
- 3.3 Selection of lighting equipment**
- 3.3.1 All lighting equipment shall be suitable for the environmental conditions to which it is likely to be exposed. Luminaires shall comply with the requirements of BS EN 60598-1:2008. Particular requirements for luminaires used for emergency lighting are set out in BS EN 60598-2-22:1998+A2:2008. Luminaires shall be CE marked.
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- G 3.3.1.1 The design of lighting installations should take into account the particular requirements of the railway environment, which can be harsh in terms of deterioration to luminaires, and difficult in terms of access to maintain the equipment. External luminaires should be Ingress Protection (IP) rated.
- G 3.3.1.2 The provision of luminaires and / or accessories unique to a particular site will necessitate a level of spares that is appropriate to the assessed rates of replacement throughout the life of the installation, and should be avoided if possible.