VOLUME 8 TRAFFIC SIGNS AND ROAD LIGHTING
SECTION 3 ROAD LIGHTING

TD 23/99

TRUNK ROADS AND TRUNK ROAD MOTORWAYS INSPECTION AND MAINTENANCE OF ROAD LIGHTING

SUMMARY

This Standard sets out inspection and maintenance requirements and recommendations for road lighting on trunk roads including motorways. It supersedes TD 23/86.

INSTRUCTIONS FOR USE

1. Remove existing contents page for Volume 8
2. Remove TD 23/86 from Volume 8, Section 3 which is superseded by TD 23/99 and archive as appropriate.
3. Insert new contents page for Volume 8 dated November 1999.
4. Insert TD 23/99 into Volume 8, Section 3.
5. Archive this sheet as appropriate.

Note: A quarterly index with a full set of Volume Contents Pages is available separately from The Stationery Office Ltd.

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THE HIGHWAYS AGENCY

THE SCOTTISH EXECUTIVE DEVELOPMENT DEPARTMENT

THE NATIONAL ASSEMBLY FOR WALES
CYNULLIAD CENEDLAETHOL CYMRU

THE DEPARTMENT OF THE ENVIRONMENT FOR NORTHERN IRELAND

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Trunk Roads and Trunk Road Motorways Inspection and Maintenance of Road Lighting

Summary: This Standard sets out inspection and maintenance requirements and recommendations for road lighting on trunk roads including motorways. It supersedes TD 23/86.

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REGISTRATION OF AMENDMENTS

Amend No	Page No	Signature & Date of incorporation of amendments	Amend No	Page No	Signature & Date of incorporation of amendments

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TRUNK ROADS AND TRUNK ROAD MOTORWAYS INSPECTION AND MAINTENANCE OF ROAD LIGHTING

Contents

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1. INTRODUCTION

General

1.1 This document outlines the inspection and maintenance requirements and recommendations for road lighting equipment through routine maintenance and response to operational failures.

1.2 The road lighting requirements of routine maintenance for the Overseeing Organisation, are specified within this standard.

1.3 This Standard replaces TD 23/86 and all other lighting maintenance instructions issued by the Overseeing Organisation, including NMMD Document N41/95 - Guidelines for the Inspection of Road Lighting Columns, LNMD Agents Circular A10/94.

Scope

1.4 This Standard sets out the requirements and recommendations for the inspection and maintenance of road lighting on Motorway and All Purpose Trunk Roads, except tunnel lighting which is covered in site specific documentation.

1.5 Detailed in this standard are the requirements and recommendations for columns up to and including:

a) 18m in height with luminaires mounted on brackets; and

b) 20m in height with post-top mounted luminaires.

1.6 All other columns, catenary systems and high masts, including associated hoists, winches and cables shall be maintained in accordance with BD 63 (Ref 1), manufacturers recommendations, the Factories Act 1961 (Ref 2), the Health and Safety at Work Act 1974 (Ref 4) and any other relevant regulations.

Implementation

1.7 This Standard should be used forthwith on trunk roads and motorways.

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2. INSPECTION

General

2.1 The purpose of inspection is to detect lighting failures and other defects as soon as reasonably practicable. Random reports from the police, motoring organisations and the public are of value and should be considered.

2.2 Inspection and maintenance of other highway systems may complement, and be carried out in conjunction with road lighting Safety and Detailed Inspections. These systems may include illuminated signs, bollards, etc and may be integrated into routine maintenance activities.

Elements of Inspection

2.3 The condition of road lighting, including electrical, mechanical and structural elements, shall be inspected for the performance and integrity of the system. The safe and effective maintenance of road lighting is dependent on trained, competent, and well equipped personnel.

2.4 Two levels of inspection shall be operated, Safety and Detailed, according to the inspection criteria.

Safety Inspections

2.5 Programmed night-time safety inspections and night outage inspections, shall identify and record all road lighting failures. However, any other defects which are observed, shall be reported.

2.6 Night-time safety inspections to detect lighting failures should be carried out from a moving vehicle, preferably containing both a driver and observer.

2.7 Inspection routes should be organised to cover the maximum number of lighting units from a moving vehicle.

2.8 Defects to other equipment and property should be reported to the Overseeing Organisation or appropriate Agent.

2.9 Additional Safety Inspections should be carried out in response to random reports as a result of extreme conditions, for example a major road traffic accident, extreme weather, etc.

Detailed Inspections

2.10 Detailed inspections involve comprehensive visual scrutiny and specified testing of the structural, electrical and mechanical elements of the road lighting system. The inspections shall include:

- Visual Inspection of Luminaires, Columns, Network Cabling and Electrical Distributions Points, including feeder pillars, switchrooms, etc for electrical, mechanical and structural condition
- Electrical Testing of all road lighting equipment
- Electrical Testing of Network Cabling
- Visual Inspection of operating environment for safety and maintenance

Inspection Criteria, Methods and Frequency

2.11 Road lighting shall be inspected to a minimum standard as specified in Annex B, Table 6, Routine Maintenance and Inspection Frequency. Any proposed deviation should be agreed by the Overseeing Organisation.

2.12 The inspection and testing for all electrical works shall comply with the requirements of BS 7671 (Ref 4).

2.13 Working practices should operate in accordance with the Institution of Lighting Engineers Code of Practice for Electrical Safety in Public Lighting Operations (Ref 5).

2.14 The summer and winter maintenance procedures operate on the official standard British Summer and Winter periods. Cyclic maintenance and inspection periods should be amended to suit the changeovers between summer and winter.

Pedestrian Subway Lighting

2.15 Pedestrian subway lighting and associated equipment should be inspected on foot in daylight. The integrity and operation of self-contained emergency luminaires should be confirmed during routine daytime highway Safety Patrols.

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2.16 Self-contained emergency luminaires should be tested in accordance with the general principles of BS 5266 (Ref 7). To provide sufficient illumination to ensure safe egress of the subway, 50% of the total emergency lighting system should be tested for full duration at each bulk lamp change. The full duration testing of any specified emergency luminaire is therefore completed every 2 years.

2.17 The frequency of inspection of pedestrian subways is specified in Annex B, Table 7, Pedestrian Subway Routine Maintenance and Inspection Intervals.

2.18 Additional guidance is provided in the Institution of Lighting Engineers Technical Report Number 13, Lighting of Pedestrian Subways (Ref 6).

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3. CATEGORY OF DEFECT

General

3.1 The condition of the road and pedestrian subway lighting systems shall be monitored through routine and non-routine inspections. Defects identified through inspections or random reports shall be categorised as specified in Table 1 - Category of Defects, according to the potential hazard they may present.

3.2 The Agent shall be responsible for the categorisation of lighting failures.

3.3 The category of defect should take into account any general or detailed column inspection reports.

3.4 Table 2 - Examples of Defects, includes some typical defects and their recommended category. Other defects should be categorised with respect to the perceived risk to the road user and general public.

Category of Defects	Description
Category 1	A defect which may result in an unacceptable structural or electrical hazard to the public.
Category 2 (High and Medium Priority)	A defect which results in an unacceptable quality of lighting or presents a safety hazard to maintenance personnel.
Category 2 (Low Priority)	All other electrical defects, lighting failures and structural faults which are considered to be less critical.

TABLE 1
CATEGORY OF DEFECTS

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<table>
<tr><th>Category of Defect</th><th colspan="2">Typical Example of Defects</th></tr>
<tr><td>Category 1</td><td colspan="2">Total column failure
Exposed, live electrical equipment
Component failure resulting in a high safety risk</td></tr>
<tr><td rowspan="9">Category 2
(High and Medium Priority)</td><td colspan="2">Number of consecutive column outages:</td></tr>
<tr><td>Number of Outages</td><td>Condition</td></tr>
<tr><td>3 or more</td><td>Up to and including 12m mounting height</td></tr>
<tr><td>2 or more</td><td>Over 12m mounting height including both lamps in dual optic units</td></tr>
<tr><td>25% or more</td><td>Single multi-optic post top or high mast column</td></tr>
<tr><td>1 or more</td><td>Either side of a pedestrian crossing</td></tr>
<tr><td>1 or more</td><td>Opposite or immediately adjacent to a road junction</td></tr>
<tr><td colspan="2">Supply failure to 2 or more consecutive columns</td></tr>
<tr><td colspan="2">A phase failure - 1 in 3 lamps out in road section</td></tr>
<tr><td colspan="2">A structural fault requiring maintenance in advance of the next routine maintenance visit - Category 3 or 4 from column general inspection.</td></tr>
<tr><td>Category 2
(Low Priority)</td><td colspan="2">Replacement of defective components
Random outages
Replacement of end-of-life equipment
Replacement of cabling having failed electrical testing</td></tr>
</table>

TABLE 2
EXAMPLES OF DEFECTS

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4. RESPONSE TIMES

General

4.1 All defects shall be repaired, according to the category of failure within the response time specified in Table 3 - Response Times.

4.2 Any departure to the response time should be agreed with the Overseeing Organisation before the maximum response time has elapsed.

Category of Defect	Maximum Response Time[1]	Additional Requirements
Category 1	24 hours	Maintenance operative shall work within the Road Safety requirements of Chapter 6 of this Standard.
Category 2 (High and Medium Priority)	7 days for Urban Trunk Roads 14 days for other road types	Where roads are restricted to cyclic maintenance closures the defect shall be repaired at the next cyclic closure. The Regional Electricity Company shall be notified of any supply failures within 24 hours
Category 2 (Low Priority)	Six months	Incorporate repairs into a planned programme of works, wherever practicable. Defects identified as requiring large scale replacement in schemes which are considered to be at the end of their useful life shall be reported to the Overseeing Organisation.

[1] **The times quoted are the maximum response times between notification of the defect to the Agent and the repair being completed.**

TABLE 3
RESPONSE TIMES

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5. MAINTENANCE

General

5.1 Wherever possible maintenance operations should be integrated within a co-ordinated maintenance programme which includes planned traffic management.

5.2 Activities which require the disposal of equipment should be carried out in accordance with any relevant legislation.

5.3 Maintenance can be either Routine or Non-Routine.

Routine Maintenance

5.4 Routine maintenance shall be carried out to maintain the integrity and safe operation of the lighting system through predefined maintenance visits.

5.5 Routine maintenance of major elements of the road lighting system are considered as follows:

- Luminaires
- Columns
- Network Cabling
- Feeder Pillars
- Switchrooms
- Non-Specific Distribution Points.

5.6 It is the responsibility of the Agent to notify the Overseeing Organisation of any other elements of the lighting system which require routine maintenance.

LUMINAIRES

Luminaires - Lamp Replacement

5.7 Lamps for road lighting shall be bulk changed at the intervals specified in Annex A, Table 4 - Bulk Lamp Change and Clean Intervals. Lamps for other purposes are specified in Annex A - Table 5, Supplementary Bulk Lamp Change and Clean Intervals.

5.8 The end cap of each lamp shall be indelibly marked with the date of installation.

5.9 Night time bulk lamp replacement shall operate within a specified method statement which has been accepted by the Overseeing Organisation.

Luminaires - Cleaning

5.10 The external surfaces of luminaires shall be cleaned during bulk lamp change.

5.11 The internal surfaces of luminaires shall only be cleaned, during bulk lamp change, where significant deposits are observed and reasonable access to the surface is available.

Luminaires - Electrical

5.12 Electrical components within the luminaire are subject to extremes of temperature, humidity, vibration and accidental damage. Components and wiring shall be checked for signs of potential failure, including discolouration, compression or abnormal abrasion of wiring insulation, expansion of component compounds, arcing, ageing, etc.

5.13 All electrical terminations shall be cleaned, tightened and renewed where necessary.

Luminaire - Mechanical

5.14 All locks, catches and hinges shall be lubricated using materials recommended by the manufacturer, or equivalent.

5.15 Spigot mounting screws shall be checked and tightened to the torque setting recommended by the manufacturer with the luminaire in the correct alignment.

5.16 All luminaire component castings and welds, in particular those associated with the spigot mounting, shall be inspected for signs of fatigue, cracking or abnormal wear.

COLUMNS

Columns - Cleaning

5.17 The base compartment of the column shall be left clean and clear of any debris.

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5.18 The column reference and other approved notices, not including signs, shall be clean, legible and the fixing visually inspected. Damaged or illegible notices shall be replaced.

Columns - Electrical

5.19 All electrical terminations shall be cleaned, tightened and renewed where necessary.

5.20 Electrical components and wiring within the column are subject to extremes of temperature, humidity, vibration and accidental damage. Components shall be checked for signs of premature failure, including discolouration, compression or abnormal abrasion of wiring insulation, arcing, ageing, etc and be correctly fixed.

5.21 Circuit protective devices shall be checked for correct rating and replaced where defective or incorrect.

5.22 The cabling between the cut-out and the luminaire termination shall be tested in accordance with the electrical tests as specified for Network Cabling.

Columns - Structural/Mechanical

5.23 The column shall be inspected for any structural or mechanical defects, in accordance with the Institution of Lighting Engineers Technical Report Number 22 - Lighting Columns and Sign Posts : Planned Inspection Regime, (Ref 8).

5.24 All screws, bolts and fixed components (including signs, internal electrical components, etc) shall be checked and tightened, to the torque setting recommended by the manufacturer where specified.

5.25 All locks, catches, hinges, studs, etc shall be lubricated using materials recommended by the manufacturer, or equivalent.

5.26 Attachments to columns should meet the requirements of BD 26 – Design of Lighting Columns (Ref 9). The mounting of any notice should be inspected for defects and damage to the column surface.

5.27 Guidance on the categorisation of column defects, in line with ILE Technical Report Number 22, is provided in Annex D, Table 9 - Elements of Column Inspection.

Columns - Painting

5.28 Painted columns shall be repainted in accordance with any agreed schedule or when inspections prove it necessary. Bulk repainting is subject to approval by the Overseeing Organisation.

5.29 All paint used shall be compatible with the existing protective coating and is subject to approval by the Overseeing Organisation.

NETWORK CABLING

5.30 Road lighting systems may be supplied from a private cable network or direct from the Regional Electricity Company, REC, network. A single REC supply connected to the highway lighting system through a Network operated by the Overseeing Organisation is defined as the Network. This Network shall require routine maintenance. Supplies to individual lighting columns direct from the REC supply are subject to Electricity Supply Regulations and faults shall be reported to the REC.

5.31 Each supply, distribution, termination and interconnection of the Network shall be maintained according to the individual requirements detailed in Annex B, Table 6 - Routine Maintenance and Inspection Frequency.

5.32 Electrical tests on the network cabling shall be completed as specified in Annex C Table 9 - Electrical Test and Inspection, and recorded in accordance with BS 7671 (Ref 4).

5.33 The sealant at the distribution and termination points of Network cable ducting shall be inspected and any defects repaired.

FEEDER PILLARS

5.34 The structural and mechanical integrity of the feeder pillar ensures the effective operation of system components within a protected environment. Electrical components and wiring within the feeder pillar are subject to extremes of temperature, humidity, vibration and accidental damage. Visual inspection of components should identify abnormal conditions including abrasions, compression, ageing, arcing, etc.

5.35 All other tests and maintenance within feeder pillars shall be carried out at bulk lamp change, including:

(a) The thermostat, where installed, shall be checked for adjustment to 5°C and the heater shall be operational.

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(b) An up to date "as installed" electrical wiring schematic and layout drawing shall be available in the feeder pillar.

(c) The external and internal surfaces of the feeder pillar shall be cleaned.

(d) Access to and around the feeder pillar shall be clear and safe. Any overgrown vegetation, etc shall be removed. Tree pruning shall be carried out following liaison with the arboricultural officer of the Agent.

(e) All locks, catches, hinges, etc shall be lubricated using materials recommended by the manufacturer, or equivalent.

(f) The feeder pillar shall be inspected for any structural and/or major mechanical defects, including insecure fixing of the pillar or internal components.

(g) External surfaces of painted feeder pillars shall be repainted when inspections prove it necessary. Complete repainting is subject to agreement by the Overseeing Organisation.

(h) All paint used shall be compatible with the existing protective coating and is subject to approval by the Overseeing Organisation.

5.36 All electrical tests and maintenance within feeder pillars shall be carried out at intervals of no longer than 6 years, including:

(a) All electrical terminations shall be cleaned, tightened and renewed where necessary.

(b) All switchgear shall be maintained in accordance with the manufacturers recommendations.

(c) Circuit protective devices shall be checked for correct rating and replaced where necessary.

(d) All electrical components and wiring shall be checked for signs of potential failure, including discolouration, compression or abnormal abrasion of wiring insulation, expansion of component compounds, etc.

(e) Electrical tests, specified in Annex C, Table 8 - Electrical Test and Inspection, within feeder pillars shall be completed and recorded in accordance with BS 7671 (Ref 4).

SWITCHROOMS

5.37 Switchrooms should be considered as a confined space and be subject to relevant working practices.

5.38 The storage of equipment, which is not for the direct use or replacement of equipment within the switchroom, is subject to the approval of the Overseeing Organisation. The Agent should provide details of stored items including the material and location within the switchroom and the expected duration of storage. Regulations on the storage of specified materials may be applicable. Non-approved stored items shall be removed and the Overseeing Organisation informed.

5.39 Switchrooms shall be inspected annually.

5.40 A method statement shall be prepared for access and maintenance activities within the confined area of a switchroom for prior agreement by the Overseeing Organisation. The method statement should include operational requirements for safe entry, exit and activities within the switchroom. The Agent is reminded to operate within all applicable regulations including the Health and Safety at Work Act (Ref 3), the Construction Design and Management Regulations (Ref 10), etc.

5.41 The switchroom shall be clean and all access routes left clear.

5.42 Switchrooms and equipment therein shall be maintained in accordance with the feeder pillar requirements detailed above.

NON-SPECIFIED DISTRIBUTION POINTS

5.43 A method statement shall be prepared for maintenance activities for non-specified distribution points and agreed by the Overseeing Organisation.

Non-Routine Maintenance

5.44 Working Practices, regulations and recommendations within routine maintenance should be operated for applicable non-routine maintenance.

5.45 Reported failures shall be responded to and repaired according to the category of defect, see Chapters 3 and 4.

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Operational Requirements

Equipment Referencing

5.46 Lighting columns shall be identified by a unique reference which should be mounted 1.5 - 2.0m from the ground such that it may be visible from a moving vehicle.

5.47 Feeder pillars, switchrooms and other items of electrical equipment shall have a reference.

5.48 Equipment referencing shall be used on all "as installed" drawings.

5.49 The recommended alpha/numeric character "x-height" is 75mm for application to road lighting equipment, including columns, feeder pillars, switchrooms, etc.

5.50 The characters should be applied and maintained in accordance with BD 45 (Ref 11).

Tree Pruning and Protection

5.51 Where luminaires or access routes are obscured by trees, pruning shall be carried out following liaison with the arboricultural officer of the Agent.

5.52 Pruning or surgery to trees on private property is subject to Section 154 of the Highways Act 1980. [Section 91 of the Roads (Scotland) Act 1984 applies in Scotland]. (Ref 13)

5.53 Where excavations are necessary near trees, care must be taken not to damage roots or branches in accordance with NJUGP No.10 (Ref 12).

5.54 The effect on existing vegetation must be considered when locating new equipment as the soft estate is not normally expendable.

Electricity Procurement

5.55 Liaison, coordination and support to the Electricity Supplier, and/or Meter Operator, should be maintained for inventory information, meter reading and other procurement activities in accordance with the appropriate agreements.

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6. ROAD SAFETY

6.1 To protect personnel and road users during maintenance operations, traffic management shall comply with the requirements of Chapter 8 of the Traffic Signs Manual (Ref 14).

6.2 Short duration stops on trunk roads and motorways, for inspection, maintenance and repair purposes, should comply with the "Safety at Street Works and Road Works" Code of Practice (Ref 15).

6.3 Maintenance personnel should be suitably trained and operate the applicable safety regulations for any maintenance activity. Safe working practices and regulations are provided to protect the maintenance personnel and the road user.

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7. RECORDS AND INVENTORY

Records

7.1 The completion of an inspection report in a format agreed by the Overseeing Organisation for both Safety and Detailed Inspections shall be maintained.

7.2 All defects identified during inspection or maintenance work shall be reported and recorded, including details of any action taken or required.

7.3 Records of inspection and repair shall be retained for a minimum of seven years. These records shall be handed over to the Overseeing Organisation or their agent on termination of the agreement.

7.4 An annual report including a summary of inspections, routine maintenance operations and changes in the network shall be supplied to the Overseeing Organisation at the end of the financial year. Relevant parts of the report shall be included in the Agent's Business Plan.

7.5 "As installed" drawings shall be kept up-to-date.

Inventory

7.6 An accurate inventory, preferably computerised, shall be maintained and made available to the Overseeing Organisation on request.

7.7 The inventory shall include data to satisfy the requirements for the procurement of electricity, the effective maintenance of lighting systems, and other useful information to support maintenance strategy and policy.

7.8 The inventory shall include specified records in Annex D, Table 10 - Required Inventory Records, and it is recommended to include the information specified in Annex D, Table 11 - Recommended Inventory Records.

7.9 The inventory should be updated at least every 3 months, or as agreed with the electricity supplier, to provide the necessary information for electricity procurement and maintenance management.

7.10 The inventory should be stored, using commercially available software, on a computer system which is able to output records in a format agreed by the Overseeing Organisation.

7.11 The integrity of the inventory should be maintained through back-up facilities and procedures operated on a regular basis.

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8. REFERENCES

Ref	Title
1	BD 63, The Inspection of Highway Structures, DMRB (3.1)
2	The Factories Act 1961
3	Health and Safety at Work Act, 1974
4	BS 7671, Requirements for Electrical Installations (Wiring Regulations)
5	Code of Practice for Electrical Safety in Public Lighting Operations, Institution of Lighting Engineers
6	Lighting of Pedestrian Subways, Institution of Lighting Engineers Technical Report Number 13
7	BS 5266, Emergency Lighting
8	Lighting Columns and Sign Posts: Planned Inspection Regime, Institution of Lighting Engineers Technical Report Number 22
9	BD 26, Design of Lighting Columns, DMRB (2.2)
10	The Construction (Design and Management) Regulations 1994
11	BD 45, Identification Marking of Highway Structures, DMRB (3.1)
12	The Planning, Installation and Maintenance of Utility Services in Proximity to Trees, National Joint Utilities Group, Publication Number 10
13	The Highways Act 1980. Roads (Scotland) Act 1984
14	Chapter 8, Traffic Signs Manual
15	Safety at Street Works and Road Works, Code of Practice

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ANNEX A - MAINTENANCE INTERVALS

A1 The bulk lamp change intervals are based on all night lighting at 4000 hours per 12 month period. Other lamp change frequencies shall be related to their particular operating hours.

Lamp Type	Abbreviations	Bulk Change and Clean Interval
Low Pressure Sodium	SOX	24 Months
Low Pressure Sodium	SOX-E SOX PLUS	36 Months
High Pressure Sodium	SON	

TABLE 4
BULK LAMP CHANGE AND CLEAN INTERVALS

Lamp Type	Abbreviations	Bulk Change and Clean Interval	
		Continuous Operation	All night Operation
High Pressure Mercury	MBFU	8000 Hours	24 Months
Fluorescent	MCFE SL PL	8000 Hours	24 Months

TABLE 5
SUPPLEMENTARY BULK LAMP CHANGE AND CLEAN INTERVALS

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ANNEX B - ROUTINE MAINTENANCE AND INSPECTION INTERVALS

Type of Inspection	Inspection Area	Elements of Inspection	Frequency of Inspection
Safety	Performance of lighting system	Lamp Failure	Trunk Road (Winter) 14 days Trunk Road (Summer) 28 days Motorway 28 days
		Lamp not fully operational or cycling	
		Obscuration	
		Other notable defects	
Detailed	Luminaires	Lamp Replacement	Defined in Table 4
		Cleaning internal and external surfaces	At bulk lamp change
		Cleaning, adjustment and visual inspection of electrical components and wiring	
		Cleaning, lubrication, adjustment and visual inspection of mechanical components	
	Columns	Clean and visual inspection of base compartment, column reference number and any overhead line warning notices	At bulk lamp change
		Lubricate, adjust and visual inspection of structural condition of column, door and fixings	
		Visual inspection and repair of protective coating	
		Cleaning, adjustment and visual inspection of electrical components and wiring within base compartment	
	Network Cabling	Cleaning, adjustment and visual inspection of electrical terminations	At bulk lamp change
		Complete electrical test and inspection (See Table 8, Annex C)	Every 6 years (maximum)

TABLE 6
ROUTINE MAINTENANCE AND INSPECTION FREQUENCY

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Type of Inspection	Inspection Area	Elements of Inspection	Frequency of Inspection
Detailed	Feeder Pillar	Cleaning, adjustment and visual inspection of electrical components and wiring	At bulk lamp change
		Cleaning, adjustment and lubrication of electrical switchgear	
		Visual inspection and adjustment of thermostat (5oC) and heater operation.	
		Complete electrical test and inspection (See Table 8, Annex C)	Every 6 years (maximum)
		Visual inspection for up to date “as installed” drawing	At bulk lamp change
		Clean, adjust, lubricate and visual inspection of enclosure and support systems	
		Clear access to and around enclosure	
		Visual inspection and repair of protective coating	
	Switchroom	Subject to the approval of a switchroom safety method statement	Annually
		Cleaning, adjustment and visual inspection of electrical components and wiring	
		Cleaning, adjustment and lubrication of electrical switchgear	
		Visual inspection and adjustment of thermostat (5oC) and heater operation.	
		Complete electrical test and inspection (See Table 8, Annex C)	Every 6 years (maximum)
		Visual inspection for up to date “as installed” drawing	Annually
		Clean, adjust, lubricate and visual inspection of switchroom structure, doors and internal support systems	
		Clear access to and around switchroom	
	Non-Specified Distribution Points	Subject to the approval of a site specific safety method statement	Single phase At bulk lamp change Three phase Annually
		Inspection and tests as per Feeder Pillar	

TABLE 6
ROUTINE MAINTENANCE AND INSPECTION FREQUENCY (continued)

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Type of Inspection	Inspection Area	Elements of Inspection	Frequency of Inspection
Safety	Performance of Lighting System	Lamp Failure Lamp not fully operational Damage to Luminaires or Electrical Distribution and Support Systems	Winter 14 days Summer 28 days
Detailed	Luminaires, Columns, Network Cabling, Feeder Pillar, Switchroom, Distribution Point (where applicable)	As detailed in Table 6, Routine Maintenance and Inspection Frequency	As detailed in Table 6, Routine Maintenance and Inspection Frequency
	Cable and Equipment Support Systems	All tray, trunking, conduit, cable and equipment support systems should be inspected for structural integrity, secure fixing, and correct replacement of covers etc	At bulk lamp change
	Emergency Luminaires (where applicable)	In addition to the details in Luminaires, Table 6, the operation of emergency luminaires should be inspected and tested in accordance with the general principles of BS 5266	At bulk lamp change. Full duration tests on 50% of all units at bulk lamp change

TABLE 7
PEDESTRIAN SUBWAY ROUTINE MAINTENANCE AND INSPECTION INTERVALS

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ANNEX C - ELECTRICAL TEST AND INSPECTION

Electrical Test and Inspection * (To be carried out every 6 years, maximum)	Area of Inspection			
	Network Cabling	**Feeder Pillars**	**Switchrooms**	**Non-Specified Distribution Points**
Visual Inspection	At terminations	All components and wiring		
Continuity of protective conductors (including protective bonding and MICC and SWA parallel earth paths)	All interconnecting protective conductors	All cables and bonds (including conduit, trunking, MICC etc)		
Insulation Resistance	At supply end of cable	All internal and outgoing cables		
Polarity	Looped systems	All fuses and single pole devices installed in phase conductor		
Earth Loop Impedance	At supply point and furthest point on network	For each outgoing network cable		
Earth Electrode	At all electrodes on network	Where applicable		
Operation of Residual Current Devices	Not applicable	Tested using equipment independent from the device		
Voltage drop	At supply point and furthest point on network	For each outgoing network cable		

TABLE 8
ELECTRICAL TEST AND INSPECTION

* BS 7671 (Ref 4) and the Institution of Lighting Engineers Code of Practice for Electrical Safety in Public Lighting Operations (Ref 5) should be consulted.

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ANNEX D - ELEMENTS OF COLUMN INSPECTION

Column Element	Inspection Criteria	Potential Defects	Recommended Category of Defect Action
SPIGOT	Visual Inspection	Rust Staining	3
		Abnormal Luminaire Tilt	3
ELBOW	Visual Inspection	Rust Staining	2
		Rust Scaling	3
		Abnormal Angle	3
		Cracking	4
BRACKET JOINT	Visual Inspection and Test	Rust Staining	2
		Weld Cracking	4
		Deformation of Bracket	3
		Correct Torque Adjustment of Pinching Screws	Test
SHOULDER	Visual Inspection	Rust Staining	2
		Rust Scaling	3
		Weld Cracking	4
		Abnormal Paint damage at or about the weld	3
SHAFT STEPS	Visual Inspection	Rust Staining	2
		Rust Scaling	3
		Weld Cracking	4
		Abnormal Paint damage at or about the weld	3
DOOR HINGE AND LOCK	Visual Inspection and Maintenance	Lubrication of Hinge	Maintenance
		Deformation of Hinge Components	2
DOOR APERTURE	Visual Inspection	Cracking at corners	4
		Deformation of Edges due to misfitting door or external impact	2
		Cracking of Edge Reinforcement	3
		Rust Staining of Edge Reinforcement	2

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Column Element	Inspection Criteria	Potential Defects	Recommended Category of Defect Action
BASE COMPARTMENT	Visual Inspection and Maintenance	Remove redundant material	Maintenance
		Remove any rust debris	Maintenance
		Rust Staining	2
		Rust Scaling	3
ROOT	Visual Inspection and Selective Test	Rust Staining	2
		Cracking	4
		Measure metal thickness at ground level	Selective Test
		Abnormal damage to Paintwork	3
FLANGE PLATE	Visual Inspection	Rust Staining	2
		Deformation or distortion of fixing holes	4
		Weld cracking	4
		Defective grouting	1
FLANGE BOLTS	Visual Inspection and Test	Correct Torque adjustment of studs	Test
		Rust Staining	2
		Cracking of bolts	4
		Deformation or distortion of bolts	3
		Defective anti-corrosion protection	1
FOUNDATION	Visual Inspection	Rust Staining (not evident on column)	2
		Deformation or decay	4
PROTECTION SYSTEM	Visual Inspection	Overall condition of paint work	1 or 2

TABLE 9
ELEMENTS OF COLUMN INSPECTION

* The Recommended Category of Defect Action is as defined in the ILE Technical Report Number 22, Lighting Columns and Sign Posts : Planned Inspection Regime, (Ref 8)

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ANNEX E - INVENTORY SYSTEM INFORMATION

	Record	Description
1	Road Name, Number and carriageway (where applicable)	Reference commonly used for road location
2	Area Location Description	Street name, Village name, junction reference, etc
3	Supply Point Reference	Reference number of Electricity supply point eg feeder pillar number
4	Meter Number or Grid Supply Point	Reference number of Meter (where the supply is actually metered), or Grid Supply Reference
5	Equipment Reference Number	Number given to the column, luminaire or bollard for maintenance records
6	Number of Electrical Units at reference	Eg number of luminaires mounted on same column
7	Number of lamps per unit	Multi optic or multi bracket installation on single column
8	Lamp Type	SON, SOX, etc
9	Lamp rated watts	135, 400, etc
10	Type of control gear	Tapped, thermal cut-out, electronic, etc
11	Operating criteria	24 hour, controlled, etc
12	Unit Control System	PECU, timeswitch, mainsbourne signalling, etc
13	Switching definition of Control system	70 lux, Summer 2100 to 0500, Winter 1700 to 0700, etc
14	Regional Electricity Company	The host area Regional Electricity Company
15	Luminaire Commission date	Date the luminaire was installed or replaced
16	Luminaire Clean date	Record of last clean date
17	Last Lamp Change date	Date of individual lamp replacement date
18	Last Electrical Test and Inspection	Date that equipment was electrically tested

TABLE 10
REQUIRED INVENTORY RECORDS

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	Record	Description
1	Location of Equipment in relation to a local landmark	Marker post, church, etc
2	Position of equipment in relation to kerb or specified lane	To distinguish between units at or about the same location
3	Column mounting height	
4	Column manufacturer	
5	Column material	Steel, aluminium, etc
6	Column protective coating	Galvanising, paint (including paint colour to BS 4800), etc
7	Column fixing	Root, flange, wall mount, etc
8	Column cross section	Tubular, multi-faceted, etc
9	Column commission date	Date installed or replaced
10	Bracket projection	Length of bracket arm (nil for post top)
11	Luminaire Optical distribution	Manufacturers reference to the optical adjustment of the reflector or bowl
12	IP rating of luminaire	
13	Manufacturer of luminaire	
14	Manufacturers reference	Model number and coding defining the luminaire
15	Operation of supply network	REC supply, private network, etc

TABLE 11
RECOMMENDED INVENTORY RECORDS

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