Traffic Open Products and Specifications

TOPAS 2506A

Performance Specification for Above Ground On-Crossing Pedestrian Detection Systems

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A (v5)	11/03/16	Final	Board

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TOPAS 2506A

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CONTENTS

Section

Corrigendum 15/5/24:

Amendment to clause 2.27

Removal of references to HA specifications and documents

Updated Appendix Z

1 INTRODUCTION

1.1 This specification details the essential requirements for above ground on-crossing pedestrian detection systems on public highways.

1.2 TOPAS specifications are explicitly purchasing specifications and compliance with them is not mandatory. However Local and other Purchasing Authorities may typically require that equipment purchased complies with TOPAS specifications and is TOPAS registered.

1.3 Manufacturers may register products as being compliant with this specification, using the process defined in TOPAS 0600

1.4 TOPAS registration requires manufacturers submit a Technical File to an appropriate Technical Assessor to aid compliance verification. The content requirement for the Technical File is defined in Appendix Z of this specification.

1.5 Guidance to potential users of this Product is given in Appendix A.

1.6 Within this specification, “The Product” shall mean all components necessary to provide a complete operational unit meeting the requirements of this specification and the common requirements defined in TOPAS0600.

Implementation

1.7 This specification implements requirements as originally defined in HA specification TR 2506A. Product Approvals to TR2506A may be used to register products to this specification as defined in TOPAS 0600

1.8 This specification will be immediately implemented from the date of issue for all new TOPAS Registrations

Glossary of Terms

1.9 A comprehensive glossary of terms and abbreviations may be found in the Institute of Highway Engineers guidance note “Traffic Control and Information systems”.

1.10 TOPAS Terms are defined in TOPAS 0600 and TOPAS 0601.

1.11 The DfT Traffic Signs Manual, provides guidance on the application of traffic signals in the United Kingdom.

2 FUNCTIONAL REQUIREMENTS

General

2.1 The Product defined in this Specification provides the detection functions that assist the safe passage of pedestrians at a pedestrian crossing.

Performance

2.2 The detection zone requirements for this Product are as shown on Figure 2.1.

2.3 For the purpose of this specification a minimum sized person is defined as having a height greater than or equal to 1 metre, width 0.5 metre, depth 0.2 metres, mass of 20 Kg.

2.4 The conditions of 2.3 shall include a person seated in a wheelchair, pushchair or invalid carriage.

2.5 For the purpose of this specification a maximum sized person is defined as having at least a height of 2.0 metres, width of 0.75 metres, depth of 0.35 metres, mass of 80 Kg.

2.6 In addition to pedestrians the Product shall also detect cyclists, and mounted equestrian riders.

2.7 The performance criteria shall apply, irrespective of apparel worn, all meteorological condition and ambient light levels.

Must Detect Zone

2.8 The Product shall be capable of being configured on site to set the dimensions of the must detect zone anywhere between the minimum and maximum dimensions defined in Figure 2.1.

2.9 The Product shall maintain a continuous detect condition output when a minimum sized person is detected moving in this zone in a direction perpendicular to the Product at all speeds between:

i) 0.5 metres per second;

ii) 10 metres per second.

2.10 The Product shall produce a detect condition for any motor vehicle, moving parallel to the footway, at a speed greater than or equal to 10kph, in either direction through this zone.

2.11 The product shall detect any target equal to or greater than that defined in 2.3 within 500 ms of entering the zone.

May Detect Zone

2.12 The Product may detect people, cyclists, mounted rider or vehicles in this zone.

Must Not Detect Zone

2.13 The Product shall not detect pedestrians, cyclists, mounted riders or vehicles in this zone.

2.14 In the event of a detected malfunction or degradation of performance below that required by this specification and the ability to diagnose this, the detector shall follow the process for a category 2 fault.

Mutual Interference

2.15 The Product shall be designed and tested to ensure that it does not affect, or is affected by, the operation of another similar Product when correctly mounted and tested in the following positions:

i) back to back with the housings 25 ± 10mm apart;

ii) at right angles with the backs of the housings 25 ±10mm apart;

iii) face to face at 20m apart;

iv) side by side at 10m apart, facing the same direction.

Interface

2.16 The interface between the Product and an approved Signal Controller shall be in accordance with TOPAS 2523.

2.17 An indicator showing the output status of the Product and, if available, the fault status, shall be positioned such that it is visible from behind and below the unit.

2.18 An option may be included that will inhibit the operation of the status indicator when the ambient light falls below 55 LUX.

Electrical Requirements

2.19 The Product shall operate from a 24v ±20% supply either AC (RMS, 50Hz) or DC.

2.20 The Product shall conform with the requirements of BS 7671 Requirements for Electrical Installations

2.21 An interruption of the Product's electrical supply shall cause a Category 1 fault. Fault categories are detailed in *Failure modes.*

Construction

2.22 The housing shall be coloured in accordance with the Zebra, Pelican and Puffin Pedestrian Crossings Regulations and General Directions 1997.

2.23 The housing shall be supplied with a fixing bracket that will permit a detector to be accurately aligned to satisfy the performance requirements.

2.24 The bracket shall be supplied with a locking arrangement capable of maintaining the alignment of a detector and should be designed to resist vandalism.

Reliability

2.25 The Product shall be designed and manufactured to have a MTBF (Mean Time Between Failure) prediction figure of greater than or equal to 20,000 hours continuous operation.

Fault Modes

Category 1

2.26 The Detect output shall present a high impedance output within 3000 ms.

2.27 When power is restored, the Product shall resume normal operation within 300s. During the start up process before normal operation all detector outputs shall take the state of a detection event being present.

Category 2

2.28 The Detect output shall present a high impedance output within 3000 ms.

2.29 If the Product is designed with auto fault correction and the fault condition ceases, then the Product shall resume normal detection operation and the fault output signal shall be removed.

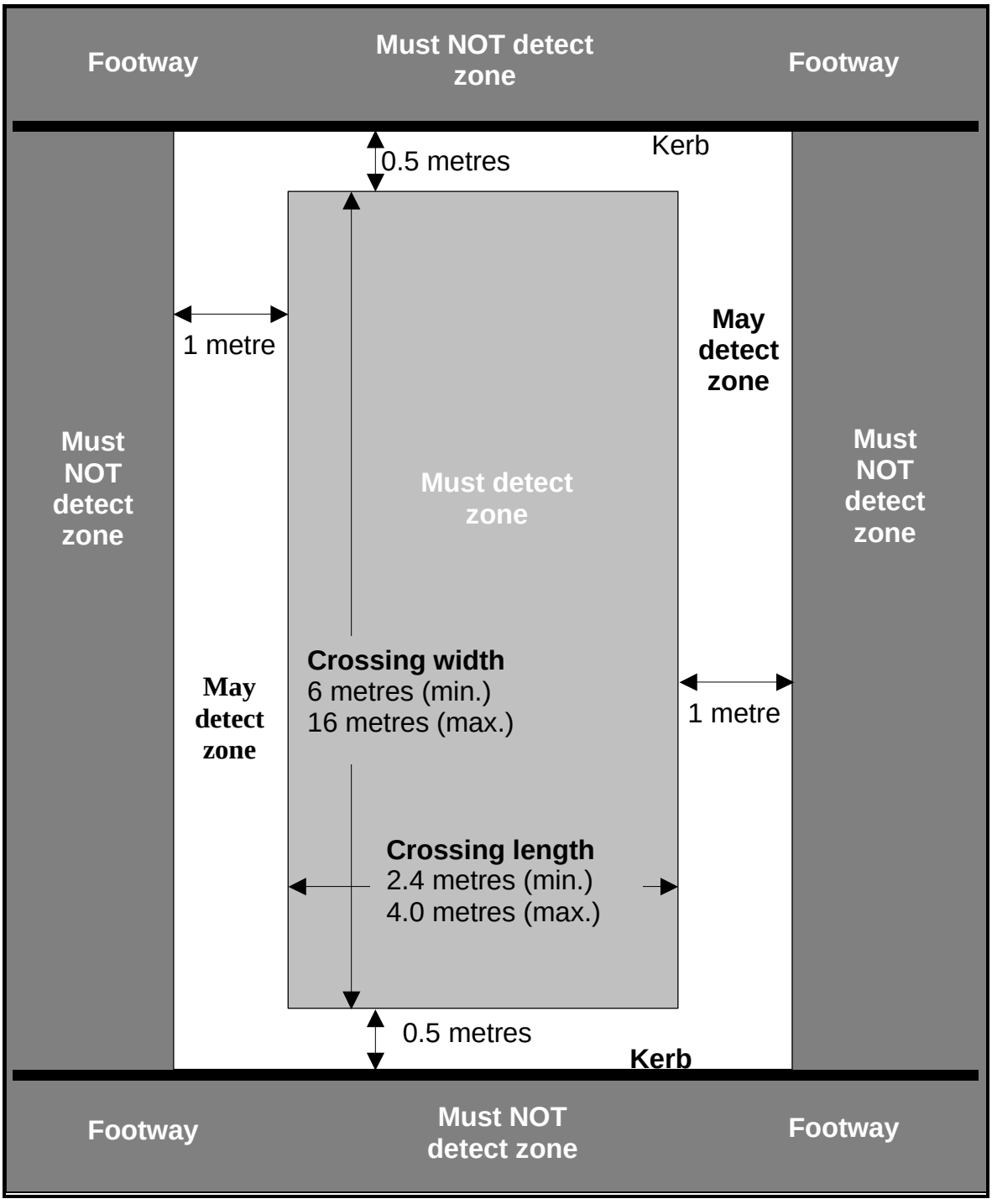

Figure 2.1
"On–Crossing" Zone of Detection

3.1 Where undated references are listed, the latest edition of the publication applies.

British Standards

3.2 The British Standards Institution, London, publishes British Standards.

BS 7671	Requirements for Electrical Installations
BS 7987:2001	Road Traffic Signal Systems
BS EN 50293	Electromagnetic Compatibility (Road traffic Signal Systems Product Standard)
BS EN 60529	Specification for Degrees of Protection Provided by Enclosures (IP Code)

Specifications

3.3 TOPAS Limited specifications are available from www.topasgroup.org.uk

TOPAS 0600	Self-Certification Procedures for Statutory Approval of Traffic Signal Control Equipment
TOPAS 2500	Specification for Traffic Signal Controller
TOPAS 2523	Traffic Signal Equipment Interfacing Specification

Other Publications

TSRGD	Traffic Signs Regulations and General Directions
ZPPRGD	The Zebra, Pelican and Puffin Pedestrian Crossings Regulations and General Directions
SHW	Volume 1 of the Manual of Contract Documents for Highway Works.
	Traffic Signs Regulations (Northern Ireland) 1997
	Road Traffic Regulation Order 1997 (Northern Ireland)
	Disability Unit Circular 1/91
TA 84	Code of Practice for Traffic Control and Information Systems All-purpose Roads
TAL 1/02	The installation of Puffin Pedestrian Crossings
Directive 89/336/EEC	EMC Regulations 1992, (Statutory Instrument 1992 No 2372)

APPENDIX A INFORMATIVE GUIDE

General

A1 This appendix is an informative guide to Systems Integrators and Highways Authorities who wish to purchase / hire and use Pedestrian/Vehicle Detection Equipment, for use with Pedestrian facilities associated with Permanent Traffic Signal Controllers, that has been declared conformant to this specification. Prospective purchasers/hirers should ensure that the procurement contract address the following issues.

A2 The Procurement Contract should specify that he connector should be as either the Bulgin plug as described in paragraph A3 or the flying lead as described in A4.

A3 Where the Product is fitted with Bulgin Buccaneer type plugs, Series PX0728/P 9 pole (or equivalent) the connection designations should be as Table A1.

Table A1
Bulgin Plug Pin Designations

Contact	Circuit	Core Colour
Pin 1	24v	Red
Pin 2	24v	Black
Pin 3	Earth/Screen	Green/Screen
Pin 4	Common	White
Pin 5	Output	Yellow
Pin 6	Spare	Blue
Pin 7	Spare	Violet
Pin 8	Spare	Orange
Pin 9	Spare	Pink/Brown

A4 Alternatively, where the detector is be supplied with a flying lead it should be made of cable generally in accordance with Def-Stan 61-12 (Part 4) 7/0.2 mm PVC insulated, overall braid screened, PVC sheathed (code 7/2/10C or equivalent). The terminated cable should have a minimum length of 1 metre and the same colour designations as in Table A1.

Marking and Labelling

A5 The purchase contract should ensure that the Vehicle Detection Equipment is fitted with a label displaying the following:

i) The unique product identifier including serial number

ii) The TOPAS Specification and associated Appendix against which it has been declared compliant.

iii) The electrical supply requirements of the Product;

APPENDIX Z TECHNICAL FILE CONTENT

This appendix defines the necessary content for a Technical File (a collection of relevant documents) which must be reviewed by an appropriate Technical Assessor as part of the TOPAS Registration process (See TOPAS 0600).

The 'ticked' items are required to be present in a Technical File used to support TOPAS Registration against TOPAS 2506A.Please read the description criteria carefully.

Ref	Item	Description	Required
1	Overview document	A summary document outlining the product, specifying which TOPAS and other relevant specification(s) the product has been designed to comply with, together with a detailed table of contents for the Technical File. Where external certificates or documents are referred to these shall be included either: (a) within this overview document; or (b) supplied separately as part of this Technical File.	✓
2	QA accreditation certificate(s)	A copy of the Quality Management Registration Certificates for the organisation applying for TOPAS Product Registration.	✓
3	Details of all required standards and regulations including CE/CA requirements that apply to the Product	A list of all standards to be complied with. Including explicit CE/CA declarations of performance/conformity for those standards, including all certificates, shall be included in this Technical File.	✓
4	A functional design description of the product	Title, document number, version and date of the overall System Design Document for the Product.	✓
5	Product part numbers	A list of top-level assembly part numbers and their issue states including all firmware / software part numbers and issues.	✓
6	Statement of Compliance	A clause-by-clause statement of compliance against TOPAS 2506A confirming compliance or non-compliance and referencing supporting evidence. (An example template can be found on the TOPAS website)	✓
7	Functional test procedures and results	A list of all functional test schedules and test result documents (by document number and issue) that substantiate the Statement of Compliance.	✓

8	BS EN 50293 EMC test procedures and results	(a) Title, document number, version and date of the EMC test performance requirement document. (b) Copies of the results of EMC testing undertaken by an appropriately qualified independent approved test house must be included in the Technical File.	✓
9	Optical test procedures and results required by this specification	For all products which have any defined optical performance requirements (a) Title, document number, version and date of the optical test performance requirement document. Copies of the results of optical testing undertaken by an appropriately qualified independent approved test house must be included in the Technical File.	N/A
10	Environmental test results	(a) A list of relevant Environmental tests performance requirements defined in TOPAS 2130. Copies of the results of the Environmental testing undertaken by an appropriately qualified independent approved test house must be included in the Technical File.	✓
11	Radio Equipment Regulations test results	For all products which include any transmitting and/or receiving radio equipment (a) A copy of the RER Declaration Of Conformity (b) Reference to the RER Technical Documentation for the product (by title, document number and version). (c) Copies of the results of radio testing, undertaken by an appropriately qualified independent approved test house must be included in the Technical File. The test results should be those identified in the RER Technical Documentation and should cover any specific IR2030 requirements for the type of radio used. A copy of the Type Examination Certificate for radio equipment not covered by a Designated EN standard.	✓
12	Primary Safety Test procedure and results	For Traffic signal Control equipment only: (a) The title, document number, version and date of the Primary Safety Test schedule.	N/A

		(b) A copy of the test results must be included as part of the Technical File.	
13	Failure Mode Analysis	For Traffic signal Control equipment only Title, document number, version and date of the product failure mode analysis requirements and results.	N/A