PAS 190:2023

Existing lighting and CCTV columns – Assessment for multifunctional use – Code of practice

Department for Science, Innovation & Technology

bsi.

Publishing and copyright information

Published by BSI Standards Limited 2023.

ISBN 978 0 539 21553 3

ICS 93.080.40

Publication history

First published April 2023

Contents

Foreword

This PAS was sponsored by the Department for Science, Innovation & Technology (DSIT). Its development was facilitated by BSI Standards Limited, and it was published under licence from The British Standards Institution. It came into effect on 30 April 2023.

Acknowledgement is given to Steven Peel of Reset and Focus! Ltd, as the technical author, and the following organizations that were involved in the development of this PAS as members of the steering group:

- BT Group plc
- Cambridgeshire County Council
- Connected Kerb
- CU Phosco Lighting
- Department for Science, Innovation & Technology (DSIT)
- Enerveo
- Freshwave
- Geospatial Commission
- Highway Electrical Association (HEA)
- Institution of Lighting Professionals (ILP)
- Metropolitan Police Service
- National Highways
- National Protective Security Authority (NPSA)
- Ontix
- Openreach
- Pendragon Management Ltd
- Reset & Focus! Ltd
- UK Smart Cities Group
- UrbanDNA
- Virgin Media O2
- Westminster City Council
- WSP

Acknowledgement is also given to the members of a wider review panel who were consulted in the development of this PAS.

The PAS process enables a code of practice to be rapidly developed in order to fulfil an immediate need in industry. A PAS can be considered for further development as a British Standard, or constitute part of the UK input into the development of a European or International Standard.

Relationship with other publications

This PAS provides recommendations and guidance for the assessment and categorization of current lighting and CCTV column inventories for multifunctional use in the UK.

It is related to PAS 191 which has been developed and published in tandem with PAS 190 and which provides a specification for the design of new multifunctional columns.

PAS 190 also relates to BS EN 40 (all parts) and to PD 6547. BS EN 40 provides an appropriate product standard on which to certify column design and production while PD 6547 provides additional guidance.

The Institute of Lighting Professionals – *Guidance Note 12* [1] and *The Smart Lighting Column and Guidance Note 22*, *Asset-Management Toolkit: Minor Structures* [2] are also relevant to the aims of this publication.

***NOTE** BS EN 40 is currently in the process of being revised. This work includes a renumbering of all parts of EN 40 but is also expected to include additional guidance which assists with the developing of products covered by this PAS.*

Although cyber security is out of scope for PAS 190, PAS 185 supplies a framework for establishing and implementing city-wide, strategic-level, security-minded approaches as part of both the development and operation of smart cities and might be useful in establishing and implementing a security-minded approach to columns.

Information about this document

Product certification/inspection/testing. Users of this PAS are advised to consider the desirability of third-party certification/inspection/testing of product conformity to this PAS. Appropriate conformity attestation arrangements are described in BS EN 40 (all parts). Users seeking assistance in identifying appropriate conformity assessment bodies or schemes may ask BSI to forward their enquiries to the relevant association.

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Use of this document

As a code of practice, this PAS takes the form of recommendations and guidance. It is not to be quoted as if it were a specification. Users are expected to ensure that claims of compliance are not misleading.

Users may substitute any of the recommendations in this PAS with practices of equivalent or better outcome. Any user claiming compliance with this PAS is expected to be able to justify any course of action that deviates from its recommendations.

It has been assumed in the preparation of this PAS that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

The provisions of this PAS are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is "should".

Commentary, explanation and general informative material is presented in smaller italic type and does not constitute a normative element.

The word "should" is used to express recommendations of this PAS. The word "may" is used in the text to express permissibility, e.g. as an alternative to the primary recommendation of the clause. The word "can" is used to express possibility, e.g. a consequence of an action or an event.

Notes and commentaries are provided throughout the text of this PAS. Notes give references and additional information that are important but do not form part of the recommendations. Commentaries give background information.

Where words have alternative spellings, the preferred spelling of the Shorter Oxford English Dictionary is used (e.g. "organization" rather than "organisation").

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Compliance with a PAS cannot confer immunity from legal obligations.

In particular, attention is drawn to the following specific regulations:

- Electronic Communications and Wireless Telegraphy (Amendment) (European Electronic Communications Code and EU Exit) Regulations 2020 [3]
- ICNIRP Guidelines for limiting exposure to EM fields [4]
- Construction Products Regulations 2013 [5]
- Electronic Communications Code (Conditions and Restrictions) Regulations 2003 [6]
- Low Voltage Electrical Equipment (Safety Regulations) 1989 [7]
- Provision and Use of Work Equipment Regulations 1998 [8]
- Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 [9]
- Control of Electromagnetic Fields at Work Regulations 2016 [10]
- Control of Artificial Optical Radiation at Work Regulations 2010 [11]

0 Introduction

0.1 The need for digital capability and connectivity

Digital capability and connectivity are essential elements of modern society. They have the potential to create new business opportunities and to enable new products and services to be conceived, designed, deployed and delivered in more effective, efficient, and ecologically sustainable ways.

Novel technologies and processes can take advantage of digital capability and connectivity to create new opportunities to enhance the functioning of society.

However, there is a growing need to deploy these new technologies in public and private spaces, and sites can be limited. Existing street lighting and CCTV columns (hereby referred to as columns) represent good examples of where current, and new, urban infrastructure can interface. Columns can potentially be transformed into multifunctional platforms for new technologies, not simply delivering lighting and CCTV services, but utilizing and/or enhancing existing power and telecommunications connections to host a variety of technologies. They can become key infrastructure elements in cities and towns as well as ports, airports, and other industry facilities.

This PAS assumes that many owners of columns (asset owners) wish to make their assets available to potential equipment and attachment owners (owners of apparatus to install within columns or attach externally to them) to deliver additional services in their place.

Similarly, this PAS assumes that equipment and attachment owners want to deploy new components and technologies (telecommunications equipment, devices, sensors or other equipment) to deliver additional services in these places and need to understand what infrastructure could be made available as a platform to host them.

0.2 Purpose of the PAS

Not all components and technologies are necessarily compatible, and not all columns can be adapted to become a multifunctional platform. This PAS articulates a process for asset owners, equipment and attachment owners to assess and categorize columns to determine their eligibility for multifunctional use (see Figure 1 and Clause **4**) and column attributes needed by asset owners (see Clause **5**).

This PAS acknowledges that attribute data required for assessment and categorization needs to be drawn from numerous data sources.

It recognizes that beyond the assessment and categorization process, there are further actions which need to be performed to enable the successful deployment and maintenance of equipment and attachments on columns.

Whilst not within the remit of this PAS, Annex A provides a template detailing attribute data which asset owners typically require from equipment and attachment owners to confirm the eligibility of a specific column for multifunctional use.

Recognizing that not all existing columns are suitable for multifunctional use, this PAS has been developed in parallel with PAS 191 for the design of new multifunctional columns where existing columns are not eligible for multifunctional use, but where the asset owners understand that multi-function columns are required in those locations.

0.3 Functions of columns

Street lighting columns are specified and designed based on the general design rules provided in BS EN 40-3. The core function of lighting columns is to support one or more luminaires for providing lighting. Luminaires are the only equipment that is currently recognized as an attachment within BS EN 40-3.

CCTV columns are similarly specified and often designed based on the general design rules provided in BS EN 40 along with guidance in CD 354, *Design of minor structures – Standards for highways* and for larger mast structures ILP PLG 07, *Institute of lighting professionals – Professional lighting guide 07 – High masts for lighting and CCTV* [12] and BS 8418 and their core function is to support one or more CCTV cameras to capture and send images to a specific place.

Despite its omission from BS EN 40 and BS 8418, a common but secondary function of columns is to provide support for other types of attachments that require mounting brackets, space within the column and, in some cases, provision of an electrical supply. In some column designs, such requirements are included in original load calculations for the column. In others they are not.

Such attachments might include for example:

a) traffic and information signs;
b) hanging baskets or floral installations;
c) festive or seasonal decorations;
d) banners or flags; and
e) litter bins.

0.4 Benefits of Smart equipment hosting

With the advent of Smart cities and communities, places in which suites of devices and sensors (Smart equipment and attachments) are deployed and connected to collect electronic data from and about people and infrastructure are increasing rapidly and becoming the norm. Electronic data from these devices and sensors is a core requirement for the delivery of a range of other services and capabilities. Digitally enabling streets and spaces in the public and private realm can improve efficiency and quality of life for communities and businesses and can reduce clutter in the street scene. Columns and mast-type structures can be considered as supporting platforms for a range of Smart equipment.

For the purposes of this PAS, Smart equipment and attachments refers to apparatus that can:

a) communicate, collect and transmit data through wired or wireless means to a computer server hosted on a private network or in a cloud environment (public or private); and

   NOTE *Cloud refers to computing services provided over the internet whereby shared resources (e.g. data storage, processing system, software, and data) are provided to connected computers and other devices on-demand such that anyone having correct authentication can access these resources. Cloud computing services might be public, private or hybrid. It is possible that attachments or equipment on the same column might connect to different cloud service providers.*

b) deliver additional services such as power or communications.

Examples of smart attachments and equipment are:

1) CCTV cameras and other safety devices;

   NOTE *Other safety devices refer to cameras that are not used for CCTV e.g. devices for traffic monitoring and footfall.*

2) Internet of Things (IoT) devices and sensors;
3) electric vehicle (EV) charging points;
4) digital advertising;
5) variable message signs;
6) electronic telecommunications; and
7) local energy generation and storage including small wind turbines, solar panels and batteries.

Columns potentially capable of hosting Smart equipment can be divided into three general types.

i) Standard functional columns designed to accept specific attachments such as luminaires and CCTV equipment. They may be able to host additional attachments but have not been explicitly designed to do so.
ii) Standard functional columns additionally designed to accept other attachments either mechanically attached to the outside of the structure or mounted inside the column – these can be referred to as specials. The attachments planned for may include signs, banners, hanging baskets, festive decorations and, in more recently manufactured columns, some digital devices.
iii) Other special (often proprietary) columns designed and manufactured with structural details that are significantly different to the standard functional lighting columns. These columns may have been developed in a modular way to allow different combinations of Smart attachments and equipment and/or designed with particular consideration of aesthetics.

Using any of these column types to host attachments can provide an economic solution to deliver digital capability and connectivity in specific locations.

0.5 Aesthetic function

Asset owners might have specific aesthetic requirements for structures within their control, for example, using specific colour schemes to complement the local street scene or to reflect corporate branding.

Aesthetic requirements vary from location to location but might include the need to blend into a heritage street scene or to provide a modern architectural feature or decorative interest.

Heritage columns are often used in historic towns and cities where original cast iron lighting columns were provided during Victorian or Georgian periods. New and replacement lighting columns follow this same style but can be manufactured from modern materials, most often a galvanized steel lighting column with decorative kits to replicate the style of the original cast iron designs.

While the appearance of heritage, architectural or decorative columns is quite different, the construction of the lighting columns is similar to the construction of functional columns, being straight-sided tubular sections with a reduction in diameter of the tube at the swage (the joint between the base and the shaft of the column).

Identifying the general type of a column is one determinant of its suitability to host other attachments.

1 Scope

This PAS provides a set of recommendations to assess and categorize current lighting and CCTV column inventories for multifunctional use.

The PAS covers the technical factors relevant for assessing the suitability of modifying current column inventories for multifunctional use, including, but not limited to:

a) small cell radio access points (base stations including 4G and 5G networks) and other electronic communications apparatus;
b) non-illuminated signage;
c) advertising banners;
d) hanging baskets;
e) festive decorations;
f) CCTV and other safety devices;
g) sensors and other IoT devices;
h) electric vehicle charging points;
i) public address systems; and
j) powered digital signage.

NOTE *The potential uses identified above is not an exhaustive list but are commonly considered. The potential uses for columns is likely to evolve over time and whilst not within the remit of this PAS, it is strongly recommended that asset owners actively explore the different technologies, devices and sensors that could be deployed. Please refer to:*

- *PAS 191 for deployment considerations for a variety of technologies, devices and sensors.*
- *DIN 91437: 2016 ("The Humble Lamppost") and*
- *Institute of Lighting Professionals (ILP) guidance note 12/21 – Multi-function Smart Lighting Columns [1].*

The PAS covers both equipment to be fitted internally and external attachments.

This PAS is based on power supplies where the maximum electric demand is assessed.

This PAS does not cover:

1) how to procure sub-components for existing lighting columns or new equipment or the services to be hosted on them;
2) the operational use, installation or maintenance of lighting and CCTV columns or Smart assets, including data protection, data privacy and grid security;
3) the design, provision or maintenance of any aspects of cyber security
4) the effect of the ongoing maintenance of existing lighting or CCTV columns or existing attachments;
5) the infrastructure and utility surrounding the lighting and CCTV column;
6) any costs incurred; and
7) staff competency.

This PAS is of use to asset owners, equipment owners and attachment owners of lighting columns in the UK [e.g. local authorities (LAs), PFI providers, highways authorities, mobile network operators (MNOs) and neutral host operators] for strategic assessment of lighting and CCTV columns.

The PAS might be of interest to manufacturers and suppliers of columns, luminaires, small cells, electric vehicle charging points, CCTV, IoT sensors and actuators, advertising panels and street signage.

This PAS might also be of interest to installers and maintenance providers, including providers of power, coaxial and fibre optic cables.