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5G Working at Height Challenges

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Street Furniture

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The Humble Lamp Post

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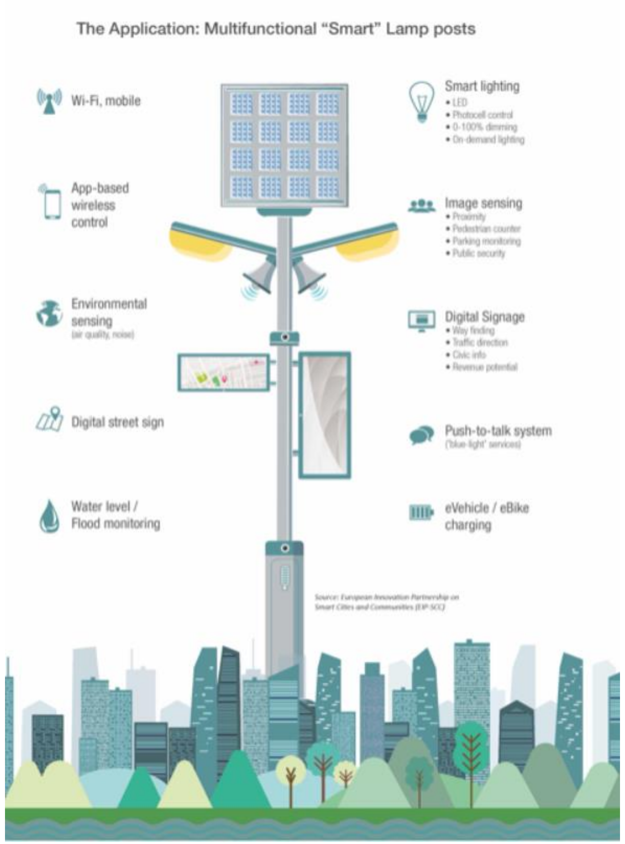

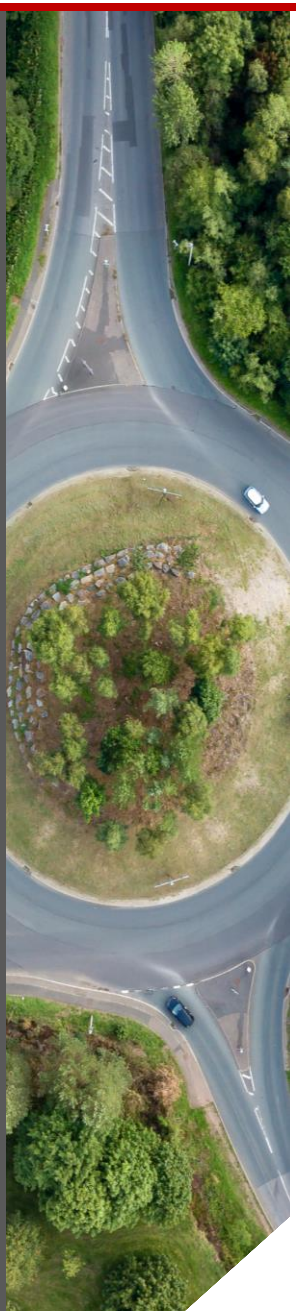

Strongest Column?

History of the Lamp Post

5.2 **Shaft**

5.2.1 **General**

5.2.1.1 The purpose of the lighting column shaft is merely to gain height above ground to allow mounting of the luminaire at the correct height. As such it does not have the technical complexity of the base section and fewer requirements are laid down for its construction. It does, however, have limitations relating to stress loading and its size and material thickness are governed by structural calculation. It therefore has to be designed according to the requirements placed upon it by its environment and attachments.

5.2.1.2 As such, the specifier has to lay down the loading factors for the lighting column:

- Terrain category
- 10 minute mean wind velocities
- Maximum altitude for the installation
- Category of rationalised wind loading
- Rationalised wind loading factor
- Ground type into which the lighting column is planted
- Lighting column nominal height
- Bracket projection (if required)
- Luminaire weight
- Size and weight of any attachments

History of the Lamp Post

5.2.2 Attachments

5.2.2.1 For most columns in general use, the attachment of items other than traffic signs may be discounted as items such as flower baskets or festive decorations will be limited to urban centres. These can then be removed from consideration for practical purposes with the proviso that, for any lighting column installation where this requirement is likely, the lighting columns will have to be specially designed.

5.2.2.2 However, traffic sign attachment is something that could occur almost anywhere and needs to be considered for any column in the normal run of installations. PD 6547 again helps by setting out three sign classes, with accompanying dimensions, in clause 7 of the document. As for most practical purposes the largest sign likely to be fixed to a column is a 600mm plate, either circular or triangular, by calculation of the plate surface area this fits sign class A in Table 3 (weight and windage of the luminaire for a sign, if fitted, is comparatively negligible and may be discounted). Owing to the increased requirements of manufacture (and consequent increase in cost of supply) of lighting columns required to support signs of classes B or C, it is not thought practical to include them as standard fitments.

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Wind Loading Calculations

The formula for calculating the wind loading on a column under BS EN 40 is as follows:

$$q(z) = \delta \times \beta \times f \times Ce(z) \times 0.5 \times p \times (Cs)^2 \times V_{ref}^2$$

δ, ß, p, Cs	Factors or numbers all fixed in EN 40
f	Topography Factor (1.0)
Ce(z)	Terrain category – based on location exposure
$V_{ref} = C_{alt} \times V_{ref}0$	Wind speed at sea level
C_{alt}	Altitude factor which takes into account altitude of the site

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Documentation

3. The documents: EN 40 and PD 6547

3.1 EN 40, the Standard for the manufacture of lighting columns, governs the production of all types of lighting column and in all materials. Given the limited scope of these Notes for Guidance, however, the parts that most concern this document are EN 40-2:2004 (General Requirements and Dimensions) and EN 40-5:2002 (Requirements for Steel Lighting Columns).

3.2 EN 40-3 sets out the requirements for the design of lighting columns, and as such these Notes for Guidance do not seek to change the Standard in this regard. However, local climatic conditions have a bearing on the requirements when assessing the factors influencing column design (for example, EN 40-3-1 considers wind pressure) and the BSI Technical Committee responsible for implementation of EN 40 thought it necessary to issue their own guidance pertaining to factors present in the UK climate and topography required by the Standard. This led to the BSI Published Document PD 6547:2009, not in itself a Standard but giving guidance to manufacturer and specifier alike.

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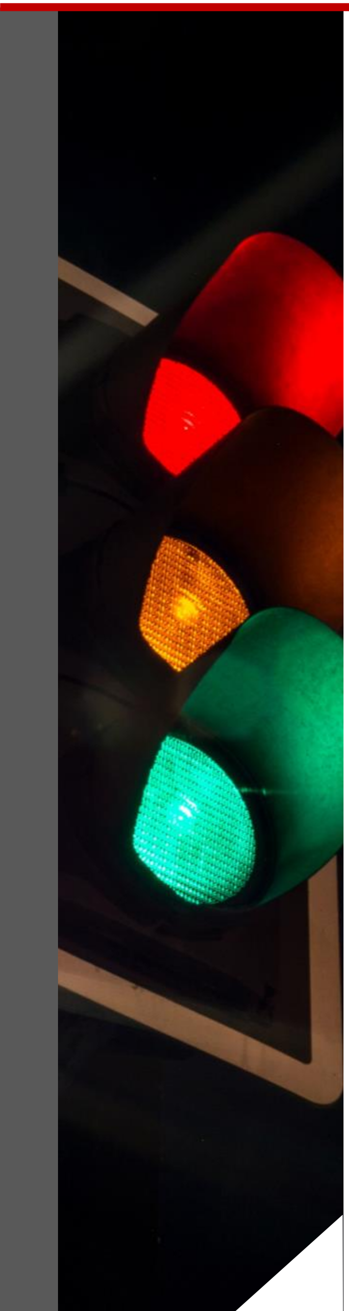

Red, Amber, Green

1

- Above 1×10^{-4} (1 in 10,000) per year the risk is considered intolerable and risk reduction is required regardless of cost.

2

- The area between the two is known as the ALARP region and many industrial activities fall into this category (see Figure 15.4).

3

- Below a lower value 1×10^{-6} (1 in 1,000,000) the risk is considered broadly acceptable and there is no need for a cost-benefit analysis.

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Structural Defects

Total number of units tested: 1,750,501

Red: 2.76% 48,314

Amber: 25.68% 449,529

Green: 71.56% 107,699

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Rationalised Wind Loading Factor – RWF

Table A2.1 Sample of table A.1 from 6547				
Administrative area	**BS EN 1991-1-4 10-minute mean wind velocity (m/sec)**	**Rationalized wind loading region**	**Maximum altitude (m)**	**Rationalized Wind Factor RWF (N/m^2)**
Greater London	22.0	Extra Light	132	350
Essex	22.5	Light	178	396
Staffordshire	22.5	Medium	226	429
Shropshire	23.0	Heavy	250	466
Durham	24.0	Extra Heavy	250	576

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Electrical Defects

Code C1 Danger present. Risk of injury. Immediate remedial action required.

Code C2 Potentially dangerous - urgent remedial action required.

Code C3 Improvement recommended.

Total number of units tested: 692,976

C1: 16.65% - 115,380

C2: 33.89% - 234,849

C3: 40.13% - 278,000

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