

**BS 8415:2018**



**BSI Standards Publication**

## **Memorials within burial grounds and memorial sites — Specification**

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This document comprises a front cover, and inside front cover, pages i to iv, pages 1 to 31, an inside back cover and a back cover.

# Foreword

## Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 July 2018. It was prepared by Technical Committee B/545, *Natural stone*. A list of organizations represented on this committee can be obtained on request to its secretary.

## Supersession

This British Standard supersedes BS 8415:2005+A2:2012, which is withdrawn.

## Information about this document

This is a full revision of the standard.

**Test laboratory accreditation.** Users of this British Standard are advised to consider the desirability of selecting test laboratories that are accredited to BS EN ISO/IEC 17025 by a national or international accreditation body when verifying conformity to this British Standard.

## Hazard warnings

**WARNING.** This British Standard calls for the use of procedures that can be injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage. In particular attention is drawn to risks involving the uplifting of components and equipment, and those involved are expected to be aware of this. In this respect the following publications are available from the HSE (Health and Safety Executive):

- *Manual Handling Operations Regulations 1992 (as amended). Guidance on Regulations* [1];
- *Manual handling at work: A short guide* [2];
- *Stone dust and you* [3];
- *COSHH essentials for stonemasons: Silica* (available in five parts) [4], [5], [6], [7], [8];
- *Controlling exposure to stonemasonry dust. Guidance for employers* [9];
- *Hand-arm vibration in the cast stone industry* [10].

## Use of this document

It has been assumed in the preparation of this British Standard that the selection of components together with the design and construction of memorials is entrusted to appropriately qualified and experienced people.

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

The horizontal load test in [Annex E](#) has been developed from the method originally derived from the Code of Working Practice [11] published by the National Association of Memorial Masons.

### **Presentational conventions**

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is “shall”.

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

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

### **Contractual and legal considerations**

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

### **Compliance with a British Standard cannot confer immunity from legal obligations.**

Particular attention is drawn to the following specific regulations:

- The Manual Handling Operations Regulations 1992 (as amended) [[12](#)];
- The Control of Substances Hazardous to Health Regulations 2002 (as amended) [[13](#)];
- The Provision and Use of Work Equipment Regulations 1998 [[14](#)].

## 1 Scope

This British Standard specifies the minimum structural design criteria and performance requirements for new and reinstated monolithic and multi-component memorials in burial grounds and memorial sites in which memorials are:

- a) fabricated from natural stone and/or concrete; and
- b) installed above and below the natural ground surface; and
- c) whose total mass does not exceed 4 t.

*NOTE 1 Memorials of a mass greater than 4 t are required to be specially designed by architects and structural engineers, and have engineering drawings submitted to the burial authority.*

It also specifies requirements for checking the condition of existing memorials.

This British Standard is intended for use by those concerned with the manufacture, installation and reinstatement of memorials and the checking of existing memorials within burial grounds or memorial sites. It does not set out to constrain artistic endeavour.

*NOTE 2 [Annex A](#) specifies requirements for the checking of existing memorials.*

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

[BS 4449](#), *Steel for the reinforcement of concrete — Weldable reinforcing steel — Bar, coil and decoiled product — Specification*

BS 5930:2015, *Code of practice for ground investigations*

[BS 6100](#), *Building and civil engineering — Vocabulary*

[BS 8004](#), *Code of practice for foundations*

BS EN 197-1:2011, *Cement — Part 1: Composition, specifications and conformity criteria for common cements*

BS EN 206, *Concrete — Specification, performance, production and conformity*

BS EN 1992-1-1, *Eurocode 2: Design of concrete structures — Part 1-1: General rules and rules for buildings*

BS EN 10088-2, *Stainless steels — Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes*

BS EN 10088-3, *Stainless steels — Part 3: Technical delivery conditions for semi-finished products, bars, rods, wire, sections and bright products of corrosion resisting steels for general purposes*

BS EN 12370, *Natural stone test methods — Determination of resistance to salt crystallization*

BS EN 12371, *Natural stone test methods — Determination of frost resistance*

BS EN 12407, *Natural stone test methods — Petrographic examination*

BS EN ISO 11600, *Building construction — Jointing products — Classification and requirements for sealants*

AS 1289-6.3.3:1997, *Methods of testing soils for engineering purposes — Method 6.3.3: Soil strength and consolidation tests — Determination of the penetration resistance of a soil — Perth sand penetrometer test*

### 3 Terms and definitions

For the purposes of this British Standard, the terms and definitions given in [BS 6100](#) and the following apply.

*NOTE* Other terms and definitions (not used in this standard) are given for information only in [Annex B](#).

#### 3.1 anchorage system

system or fixing which safeguards against sudden hazardous failure of a lawn monument

#### 3.2 base

support structure for a memorial

#### 3.3 burial authority

body appointed to administer the affairs of a burial ground or memorial site, including church yards, on behalf of its constituent owners

#### 3.4 burial ground

area set aside for internment

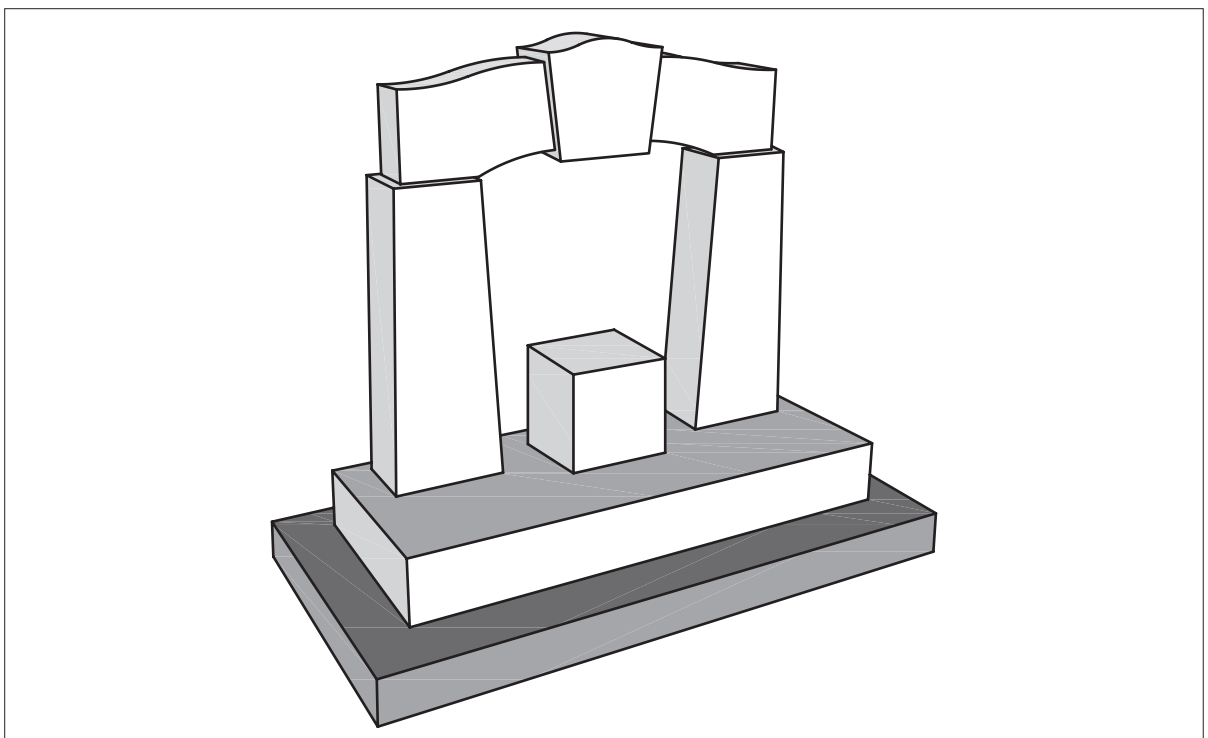
*NOTE* A memorial garden, churchyard and cemetery are types of burial ground.

#### 3.5 canopy

structure comprising two vertical elements and a spanning lintel

*NOTE* A typical canopy is shown in [Figure 1](#).

**Figure 1** — Canopy



### 3.6 characteristic compressive strength

compressive strength of a material as assessed by standard test, which is exceeded by 95% of the material

### 3.7 column

vertical structure, slender in proportion to height and used as a support or ornament

### 3.8 cramp

shaped piece of metal, suitably bedded into sinkings cut in stone units, to tie them to one another or to their backing

### 3.9 dowel

length of material sunk or cast into adjacent hidden faces to align or prevent movement, or both, of two components (see [Figure 2](#))

## 3.10 Foundation

### 3.10.1 foundation

element that connects a memorial to the ground, and transfers the loads from the memorial to the ground (see [Figure 2](#))

### 3.10.2 concrete shoe foundation

pre-cast concrete foundation, suitable for monolith type monuments, comprising flanges below ground level into which the headstone is cemented

*NOTE* See [Figure D.2](#) for typical shoe foundation.

### 3.10.3 full grave (or landing) foundation

foundation for a full grave monument which spans the grave space, and can be supported by the use of suitable bearers [See [Figure 2b](#)]

### 3.10.4 independent foundation slab

foundation slab wider than the grave, made from pre-cast reinforced concrete or a suitable hard stone [see [Figure 2a](#)]

### 3.10.5 pier foundation

independent foundation constructed from concrete blocks doweled together with the same size dowels as the headstone/base or from cast in-situ reinforced concrete

*NOTE* See [Figure D.3](#) for typical pier foundation. See also [Table 4](#) and [Table 5](#).

### 3.10.6 strip (or beam type) foundation

solid cast reinforced concrete strip designed to span a complete row of graves (see [Figure D.6](#))

### 3.10.7 trough foundation

variant of pre-cast reinforced concrete foundation with a large depressed “trough” shape moulded into the concrete to allow for multiple flower container positions

## 3.11 grave

place of burial below ground level, which might or might not be lined

**3.12 ground**

soil, rock and fill existing in place prior to the execution of construction works

**3.13 inscription**

dedication recorded on a memorial

**3.14 inscription plate**

inscribed stone on a memorial

*NOTE* Commonly known as “headstone”. See [Figure 2](#).

**3.15 kerb/kerbing**

edging stone used in connection with a memorial (see [Figure 2](#))

**3.16 ledger/cover slab**

horizontal slab used in connection with a memorial (see [Figure 2](#))

**3.17 memorial site**

area set aside in the memory of the deceased or in commemoration of an event

**3.18 Memorial****3.18.1 memorial**

freestanding object installed in a burial ground or memorial site in memory of the deceased or structure specifically created to commemorate a person or event

**3.18.2 full grave (or traditional) memorial**

large independent monument which is designed to cover the complete grave area (usually single or double grave spaces) and typically consists of a vertical inscription plate butted up to two kerbs which run the length of the grave and closed at the foot end with a short kerb with or without corner posts

*NOTE* See [Figure 2](#) for a typical full grave memorial.

**3.18.3 lawn memorial**

independent vertical inscription plate attached to a horizontal base

*NOTE* See [Figure D.1](#) for a typical “lawn” memorial.

**3.18.4 monolith memorial**

independent vertical inscription plate set into a pre-cast concrete shoe-type foundation which is set directly into the ground

*NOTE* See [Figure D.2](#) for a typical “monolith” monument. The most common version of this type of memorial is the Commonwealth War Graves Commission (CWGC) memorial.

**3.18.5 obelisk**

tall four-sided tapered monument

**3.19 memorial work**

construction and reinstatement of memorials

**3.20 natural stone**

naturally occurring material constituting the crust of the earth

**3.21 ornament**

decoration on a memorial

**3.22 pier**

vertical element supporting a structure

**3.23 plinth/sub-base**

component between the base of the memorial and the foundation (see [Figure 2](#))

**3.24 plot**

land upon which a memorial is erected

**3.25 reinstated memorial**

memorial which has been reinstated following dismantling or other structural work

**3.26 slate**

rock derived from argillaceous sediments or volcanic ash by metamorphism, characterized by cleavage planes independent of original stratification

**Figure 2** — *Typical components of a memorial*

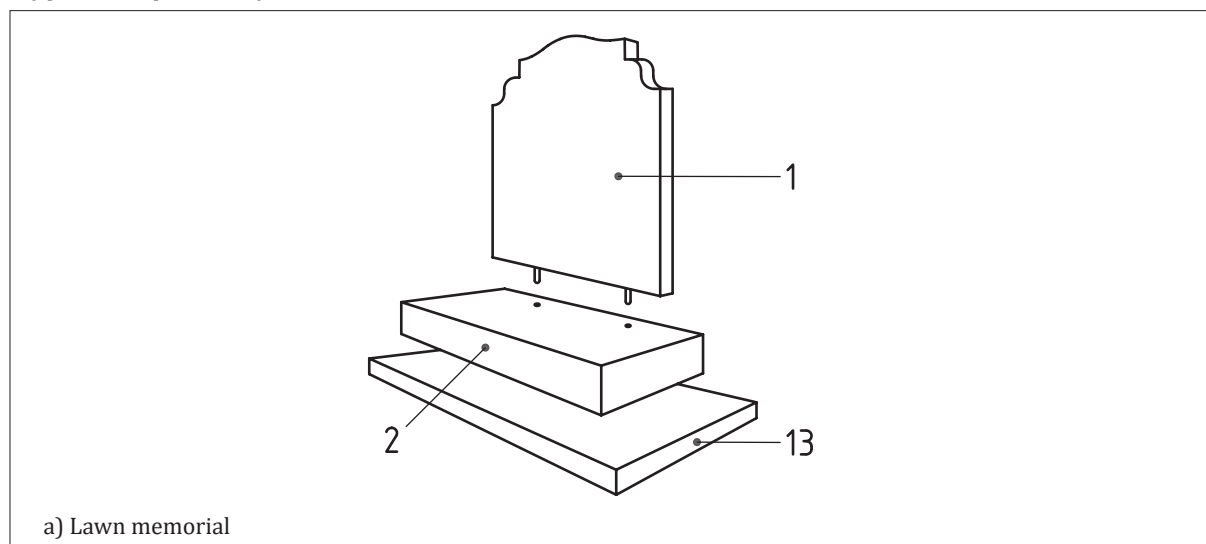
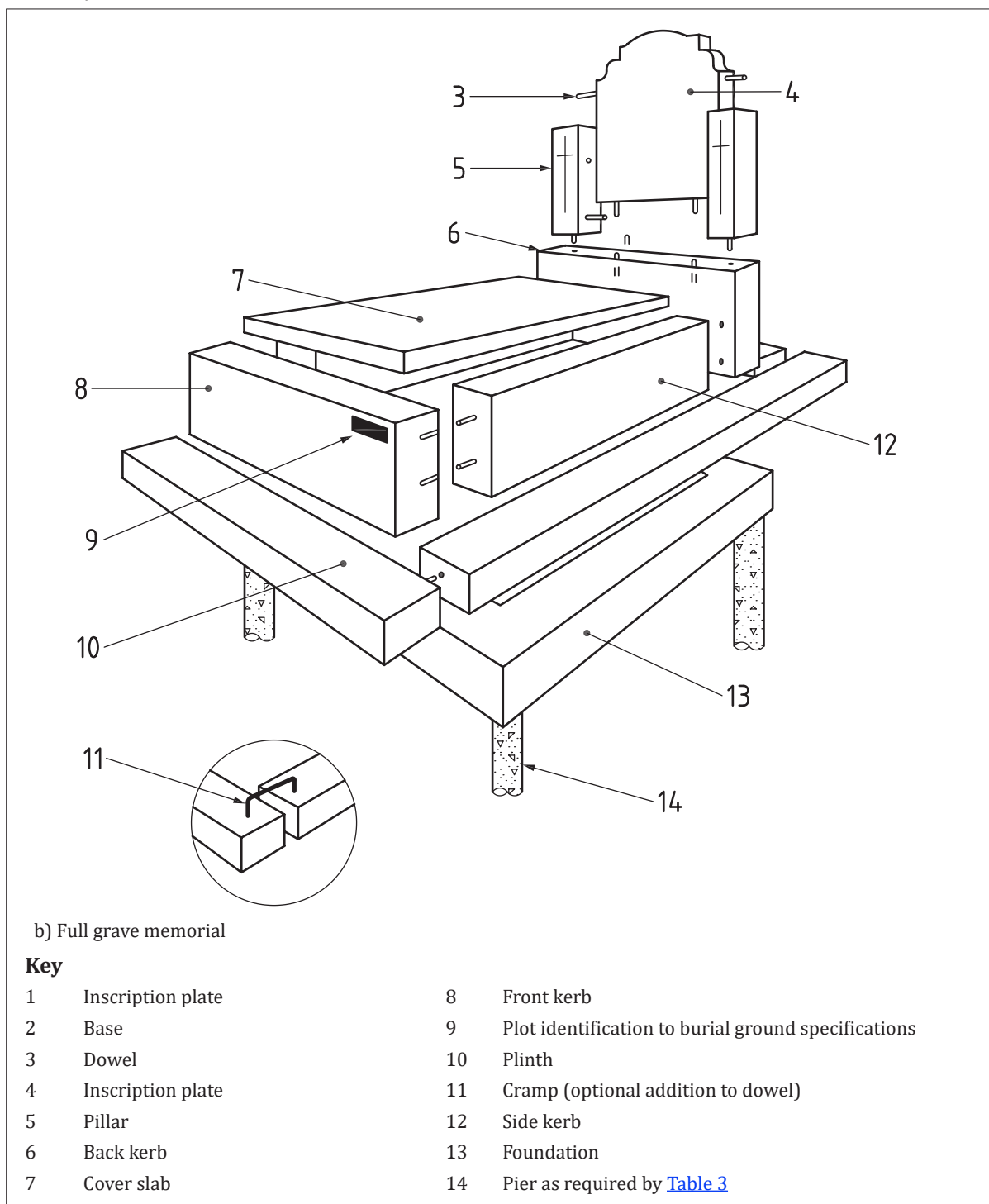


Figure 2 (continued)



## 4 Materials

**NOTE** The structural materials used to construct memorials should exhibit high atmospheric-corrosion-resistant properties.

### 4.1 Cement

Cement used in memorials within burial grounds and memorial sites shall be in accordance with BS EN 197-1:2011, type CEM I, strength class 42.5.