



BSI Standards Publication

Workmanship on construction sites

Part 8: Design and installation of dry lining systems –
Code of practice

Publishing and copyright information

The BSI copyright notice displayed in this document indicates when the document was last issued.

© The British Standards Institution 2024

Published by BSI Standards Limited 2024

ISBN 978 0 539 31126 6

ICS 91.060.10; 91.200

The following BSI references relate to the work on this document:

Committee reference B/544

Amendments/corrigenda issued since publication

Date	Text affected
July 2024	C1: Correction to Figure 2, Figure 3, Figure 5b), Figure 16e) and Figure 20b) Correction to values in 7.5.10a) and 7.5.10b) Additional wording in 8.11.2.2 (referring to Figure 19)

Contents

	Page
Foreword	III
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 General statement on accuracy	5
5 Competency	6
6 Materials and handling preparation	6
6.1 General	6
6.2 Receipt	6
6.3 Storage	6
<i>Figure 1 — Plasterboard stacked on bearers</i>	7
6.4 Sorting	7
6.5 Preparation of work, materials and components	7
6.6 Checking and handling of materials and components	8
7 Design	9
7.1 Fundamentals of design	9
7.2 Types of dry lining systems	11
7.3 Types of ceilings	13
7.4 Performance of dry lining systems	14
<i>Figure 2 — Typical head details of partitions to accommodate vertical deflection of the structural element</i>	17
7.5 Deviations and tolerances	20
<i>Figure 3 — Impact on tolerance created by overlapping metal framing</i>	22
<i>Figure 4 — Deviation band</i>	26
<i>Figure 5 — Permissible deviations on jointing and 90° corners</i>	27
<i>Figure 6 — Straight edge for measuring deviations at external and internal angles</i>	28
<i>Figure 7 — Measuring the internal corner</i>	29
<i>Figure 8 — Casing detail showing tolerances for external corners of horizontal casings</i>	31
<i>Figure 9 — Methods of measuring internal and external corners of column casings</i>	31
7.6 Provisions for services	32
7.7 Wall tiling	32
7.8 Finishes	34
7.9 Environmental conditions	35
7.10 Thermal insulation	35
<i>Figure 10 — Service zone to external wall with AVCL and plasterboard linings</i>	36
7.11 Materials	36
<i>Table 1 — Metal stud types</i>	38
8 Installation	40
8.1 General	40
8.2 Background	40
<i>Figure 11 — Suggested adhesive dab fixing pattern for gypsum plasterboard and insulated composite plasterboard</i>	41
<i>Figure 12 — Plasterboard adhesive layout</i>	42
8.3 Timber backgrounds	43
<i>Figure 13 — Plasterboard fixing positions</i>	43
<i>Table 2 — Spacing of timber supports in walls and partitions</i>	43
<i>Figure 14 — Joints over timber supports in partitions and linings</i>	44
<i>Figure 15 — Joints over timber supports in ceilings: fastening near cut ends of boards</i>	44

8.4	Steel	45
	<i>Figure 16 — Edge fixing dimensions for plasterboard edges</i>	45
	<i>Table 3 — Minimum screw lengths for metal and steel supports</i>	47
8.5	Continuity and consistency of workflow	47
8.6	Use of plant and equipment (including certain power tools)	47
8.7	Accuracy	48
8.8	Planning and coordination with other trades	48
8.9	Provision for services (gas)	48
8.10	Safety issues	48
8.11	Work on site	48
	<i>Figure 17 — Setting out plasterboard external angles and abutments</i>	49
	<i>Figure 18 — Setting out plasterboard intermediate joints on studs</i>	49
	<i>Table 4 — Fixing of plasterboard and insulated composite plasterboard with gypsum-based adhesives</i>	51
	<i>Figure 19 — Wall lining to ceiling junction</i>	51
	<i>Table 5 — Spacing of timber studs forming partitions</i>	52
	<i>Table 6 — Spacing of timber supports in ceilings</i>	53
	<i>Figure 20 — Typical steel stud partitions</i>	54
	<i>Figure 21 — Direction of plasterboarding</i>	55
	<i>Table 7 — Plasterboard adhesive centres per plasterboard thickness and size</i>	56
9	Checking	61
9.1	In-process checks	61
9.2	Checking work	62
10	Handover	63
10.1	General	63
10.2	Clearing and cleaning	63
10.3	Heading	63
10.4	Quality assurance and record keeping	63
10.5	Handover documents	63
Annex A	(informative) Design considerations, application and acceptance of dry lining finish	65
A.1	General	65
A.2	Specific arrangements which can affect the appearance of the finished work	65
A.3	Specification of flatness and smoothness	65
A.4	Task lighting during construction	66
A.5	Glancing light conditions	66
A.6	Viewing conditions	66
A.7	Choice of artificial lighting	66
	Bibliography	68

Summary of pages

This document comprises a front cover, an inside front cover, pages I to IV, pages 1 to 69, and a back cover.

Foreword

Publishing information

This part of BS 8000 is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 January 2023. It was prepared by Technical Committee B/544, *Plastering, rendering, dry lining*. A list of organizations represented on this committee can be obtained on request to the committee manager.

Supersession

This part of BS 8000 supersedes [BS 8000-8:1994](#) and [BS 8212:1995](#), which are withdrawn.

Relationship with other publications

BS 8000 is a series of standards describing the execution of works for a range of construction activities. They are issued to fill a gap in the authoritative information that is available to those specifying, supervising and instructing in connection with those activities and to assist in describing processes to ensure a better and common understanding of them and so improve construction quality.

The various parts of BS 8000 draw content from, and relate to, other relevant British Standards and codes. This part of BS 8000 makes recommendations and gives guidance on dry lining systems. It is intended to be read in conjunction with [BS 8000-0](#), which encourages liaison between and awareness of adjoining/dependent trades and processes in the construction sequence (whether or not they are subject to one of the specialist titles in the series).

Information about this document

Text introduced or altered by Corrigendum No. 1 is indicated in the text by tags C1 C1. Minor editorial corrections are not tagged.

This document applies to the construction of dry lining using gypsum plasterboards manufactured to [BS EN 520](#), [BS EN 14190](#) and [BS EN 13950](#), and metal framework components manufactured to [BS EN 14195](#) and [BS EN 13964](#).

The recommendations given are not fully comprehensive as particular project documents, e.g. project specifications might need to cover recommendations not dealt within this document. This document might not be applicable to the use of some proprietary systems.

The purpose of BS 8000-8 is to encourage good design and workmanship by providing:

- a) guidance for designers on the selection of systems;
- b) guidance for installers on the correct sequence and method of installation; and
- c) updated tolerances reflecting use and material installation and methods of measurement.

This is a full revision of the document, and introduces the following principal changes:

- 1) clarification of tolerances;
- 2) advice when installing dry lining to Steel Framing Systems (SFS);
- 3) testing of dry lining systems; and
- 4) expansion of relevant performance recommendations.

This publication can be withdrawn, revised, partially superseded or superseded. Information regarding the status of this publication can be found in the Standards Catalogue on the BSI website at knowledge.bsigroup.com, or by contacting the Customer Services team.

Where websites and webpages have been cited, they are provided for ease of reference and are correct at the time of publication. The location of a webpage or website, or its contents, cannot be guaranteed.

Use of this document

As a code of practice, this part of BS 8000 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 part of BS 8000 with practices of equivalent or better outcome. Any user claiming compliance with this part of BS 8000 is expected to be able to justify any course of action that deviates from its recommendations.

Presentational conventions

The provisions of this document 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.

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 has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient’s own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

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

1 Scope

This part of BS 8000 provides recommendations for the design and installation, including workmanship and finishing, of dry lining systems using gypsum-based plasterboards.

NOTE The general principles of workmanship on construction sites are given in [BS 8000-0](#).

It covers the performance-critical aspects of the components and workmanship used in dry lining systems such as separation, fire protection, stability, applied loadings, acoustics, thermal insulation and aesthetics. It covers the impacts on performance such as design considerations, site conditions, tolerances and penetrations and defines the clear and repeatable measurement of tolerances and deviation methods. The document is intended to be easy for the delivery team to use and understand and can be used for education and training purposes.

It is applicable to the construction sector, in relation to dwellings, non-dwellings, new builds and refurbishments.

It is for use by manufacturers, suppliers, specifiers, designers, contractors, installers, project managers and all Construction (Design and Management) Regulations (CDM) duty holders. It is also applicable to anyone with a vested interest in the end quality and performance of the dry lining, as well as building control clients and their teams.

It does not cover the installation of dry lining to systems constructed from light gauge steel framing (LGSF).

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, or limits the application, of this document¹⁾. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Standards publications

BS 476-20, Fire tests on building materials and structures – Part 20: Method for determination of the fire resistance of elements of construction (general principles)

BS 476-21, Fire tests on building materials and structures – Part 21: Methods for determination of the fire resistance of loadbearing elements of construction

BS 476-22, Fire tests on building materials and structures – Part 22: Method for determination of the fire resistance of non-loadbearing elements of construction

BS 476-23, Fire tests on building materials and structures – Part 23: Methods for determination of the contribution of components to the fire resistance of a structure

BS 4978, Visual grading of softwood – Specification

BS 5234-2, Partitions (including matching linings) – Part 2: Specification for performance requirements for strength and robustness including methods of test

BS 5250, Management of moisture in buildings – Code of practice

BS 6100-0, Building and civil engineering – Part 0: Vocabulary – Introduction and index

BS 6100-6, Building and civil engineering – Part 6: Vocabulary – Construction parts

BS 6100-9, Building and civil engineering – Part 9: Vocabulary – Work with concrete and plaster

¹⁾ Documents that are referred to solely in an informative manner are listed in the Bibliography.

[BS 6150](#), *Painting of buildings – Code of practice*

[BS 6180](#), *Barriers in and about buildings – Code of practice*

[BS 8000-0:2014+A1:2024](#), *Workmanship on construction sites – Part 0: Introduction and general principles*

[BS 8000-3](#), *Workmanship on construction sites – Part 3: Masonry – Code of practice*

[BS 8539](#), *Code of practice for the selection and installation of post-installed anchors in concrete and masonry*

[BS EN 388](#), *Protective gloves against mechanical risks*

[BS EN 1364-1](#), *Fire resistance tests for non-loadbearing elements – Part 1: Walls*

[BS EN 1364-2](#), *Fire resistance tests for non-loadbearing elements – Part 2: Ceilings*

[BS EN 1365-1](#), *Fire resistance tests for loadbearing elements – Part 1: Walls*

[BS EN 1365-2](#), *Fire resistance tests for loadbearing elements – Part 2: Floors and roofs*

[BS EN 13501-1:2018](#), *Fire classification of construction products and building elements – Part 1: Classification using data from reaction to fire tests*

[NA to BS EN 1991-1-1](#), *Eurocode 1: Actions on structures – Part 1-1: General actions – Densities, self-weight, imposed loads for buildings*

[NA to BS EN 1995-1-1](#), *UK National Annex to Eurocode 5: Design of timber structures – Part 1-1: General – Common rules and rules for buildings*

[BS EN 13914-2](#), *Design, preparation and application of external rendering and internal plastering – Part 2: Internal plastering²⁾*

[BS EN 13963](#), *Jointing materials for gypsum plasterboards – Definitions, requirements and test methods*

[BS EN 14195](#), *Metal framing components for gypsum plasterboard systems – Definitions, requirements and test methods*

[BS EN 14566:2008+A1:2009](#), *Mechanical fasteners for gypsum plasterboard systems – Definitions, requirements and test methods*

[PD 6688-1-1](#), *Recommendations for the design of structures to BS EN 1991-1-1*

Other publications

[N1] FIS CFA Best practice guide: *Selection and installation of top fixings for suspended ceilings* [online], April 2015, ISBN 978-0-9565341-2-5.³⁾

[N2] BRE SCOTLAND. Conventions for U-value calculations. BR 443 2e. Bracknell: BRE, 2019.

[N3] CANADIAN LUMBER STANDARDS ACCREDITATION BOARD. *Canadian Lumber Standard (CLS)*.⁴⁾

3 Terms and definitions

For the purposes of this document, the terms and definitions given in [BS 6100-0](#), [BS 6100-6](#), and [BS 6100-9](#), and the following apply.

3.1 acoustic performance

effect of elements on the properties of sound

²⁾ This standard gives an informative reference to [BS EN 13914-2:2016](#).

³⁾ Available online at <https://www.thefis.org/membership-hub/publications/best-practice-guides/top-fixings-and-suspended-ceilings/>.

⁴⁾ Available online at <https://www.clsab.ca/about-us/more-information-about-lumber-grading/what-the-grade-marks-mean/>.

3.2 air drying

ventilation or air movement to dry material

3.3 bound

long edge profile of a plasterboard where the face paper liner wraps around the edge and under the paper liner on the back of the plasterboard

3.4 competency

relevant skills, knowledge, experience and behaviour to undertake a given task

3.5 curved partitions

version of single or twin frame partition constructed to form a curve

NOTE The key limitation to the achievable radius is the ability of the lining plasterboards to accommodate the required curve.

3.6 deflection heads

form of construction detail used when needing to allow for movement (up, down or both) within the structure at the head of a partition/lining

NOTE This movement (or deflection) is created by live and dead loads on the floor or roof above.

3.7 directly bonded dry lining (dot and dab)

installation method comprising gypsum plasterboard (3.13), including insulated composite plasterboard (3.14), which is fixed directly to the structural substrate using gypsum-based adhesive and, where required, with mechanical fixings

3.8 drywall screws

corrosion resistant, self-drilling and self-tapping, trumpet-shaped and cross-punched-head steel screws for fixing plasterboards to light gauge steel sections and timber framework

3.9 encasements

metal and furring sections used to form framing to steelwork with one or multiple layers of plasterboard

3.10 fire protection

thermal insulation to structural elements for a given time and temperature curve

3.11 fire resistance

system's ability to resist a fire and stop its progress over a given time measured in minutes

3.12 framing

metal or timber assembly to support plasterboard

3.13 gypsum plasterboard

plasterboard composed of a gypsum plaster core encased in, and firmly bonded to, paper liners to form flat rectangular boards

3.14 insulated composite plasterboard

panel made from an insulating material laminated to gypsum board, with or without a water vapour retarder

[SOURCE: BS EN 13950:2014, 3.1.1, modified]

3.15 linings

metal and timber sections which are independently fixed or braced from the background to create a framed wall lining system

3.16 load-bearing

ability to transfer the load of another structural element

3.17 metal furring

non-structural metal attachment that is used to hold a finish material, plasterboard or insulating laminate

NOTE In metal framed construction, the furring pieces are long, light gauge materials of various shapes. They are predominately used for drywall metal linings and suspended ceiling systems.

3.18 noggings

short steel or timber section installed between studs or joists

3.19 non-load-bearing

wall/lining that is capable only of supporting its own weight and that of specified attachments

3.20 passive fire protection

built-in measures that protect the structure of the building or subdivide it into areas to limit the spread of fire and smoke

3.21 plasterboard types

differences in plasterboards used in industry

NOTE Examples include fire resistance, structural fire protection, sound insulation and moisture resistance when used in a system arrangement.

3.22 proprietary system

series of compatible materials and components that are tested together and which provide evidence of a required performance

3.23 reaction to fire

response of a product in contributing by its own decomposition to a fire to which it is exposed, under specified conditions

[SOURCE: BS EN 13501-1:2018, 3.1.15]

3.24 screw gun

cordless or mains powered tool for fixing screws

NOTE Designed for screwing plasterboard to metal framed and timber framed backgrounds without going below the paper surface; also used for metal-to-metal fixings on metal framed systems.

3.25 setting out

procedure of establishment of marks and lines to define the position and level of the elements for the construction work so that work can proceed with reference to them

3.26 single frame

metal or timber stud profile frame with one or multiple layers of plasterboard fixed to both faces of the frame to create a partition

3.27 skim coating

technique of applying thin layers of gypsum-based plaster or full surface gypsum-based compound over the entire plasterboard surface

3.28 sound absorption

ability to absorb sound in a space to reduce reverberation time

3.29 sound insulation

ability to reduce airborne sound from one space to another

3.30 square edge

plasterboard with a square edge profile rather than taper

3.31 staggered stud system

metal and timber studs, staggered within a single head and base metal channel or sole plate with one or multiple layers of plasterboard fixed to the frame to create a partition

3.32 system owner

person or organization who owns the performance evidence of a system

3.33 tapered edge

plasterboard with a shallow recess on the long edge of a plasterboard to enable flush seamless jointing or plastering to the surface

3.34 thermal resistance

ability to resist passage of heat measured in minutes

3.35 twin frame

two metal and timber stud frames constructed with a set frame width with one or multiple layers of plasterboard fixed to the frame on one side of each external face to create a partition

NOTE The studs can be connected (braced) or independent (unbraced).

3.36 unbound

plasterboard edges with no paper return down the edge of a plasterboard, preformed in manufacture or manually cut

4 General statement on accuracy**COMMENTARY ON CLAUSE 4**

The tolerances within this document are reliant on the background construction and the consistency in the tolerances of the materials delivered to site.

The tolerances of the background construction should be in accordance with the relevant standards below.

Manufacturing and installation tolerances should be allowed for in the design and specification of dry lining.

NOTE Guidance can be found in the following standards and literature:

- a) concrete: [BS EN 13670](#);
- b) masonry: [BS 8000-3](#);
- c) screed: [BS 8204-1](#);

- d) *structural steel: PUB 57/17 The National Structural Steelwork Specification for Building Construction [1]; and*
- e) *timber structures:*
 - 1) *National Annex to BS EN 1995-1-1;*
 - 2) *STA Advice Note: Allowable deflections in timber structures – Part 2: Timber floor structures [2];*
 - 3) *STA Advice Note: Recommended construction tolerances in timber structures – Part 3: Timber frame wall panel tolerances [3]; and*
 - 4) *STA Advice Note 14: Robustness of Cross Laminated Timber (CLT) structures – Part 4: Construction process best practice [4].*

The designer should take account of background deviations for applied linings (see 7.5).

5 Competency

All individuals and companies involved in the design, construction and management of dry lining should be able to demonstrate the relevant competency levels to carry out their element of the project.

6 Materials and handling preparation

6.1 General

Planning for the safe delivery and movement of plasterboards should be undertaken as early in the design process as practicable and be clearly communicated with the delivery team.

NOTE For more information see the Health in Construction Leadership Group's Ingress of plasterboard report⁵⁾.

At each stage, materials should be verified as meeting the requirements of the system to be installed.

6.2 Receipt

The site logistics plan should be in place for the safe delivery and distribution of construction materials to site.

NOTE Safe delivery means avoidance of damage by mechanical and/or environmental conditions and avoidance of manual handling to prevent risk of injury.

At the point of receipt, prior to distribution, all materials should be verified as compliant with the order.

6.3 Storage

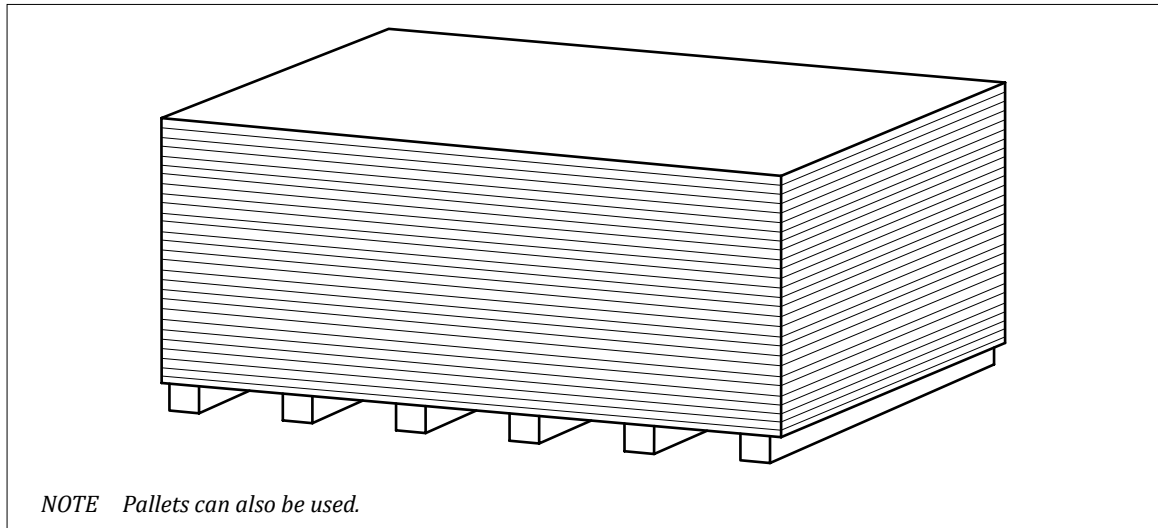
All construction materials should be stored in dry and flat locations on site as follows.

- a) Plasterboards should only be stored on a clean, dry and level site, horizontally on a level base consisting of a pallet or bearers at least 100 mm wide laid across the width of the plasterboard at centres not exceeding 400 mm (see Figure 1). If they are not stored in a dry and level building, then the stack should be completely covered with a weatherproof sheet secured all round. They should also be protected from damp rising from below the stack. Unless special provisions are made, plasterboards should not be stacked to a height more than 1 m per pallet/bearer.
- b) Metal should be stored flat and supported along its length to prevent distortion and breakage. Galvanized coatings should not be damaged.
- c) Timber should be stored in dry conditions and in accordance with industry requirements.

⁵⁾ Available at <https://www.thefis.org/membership-hub/publications/best-practice-guides/recommendations-for-the-safe-ingress-of-plasterboard/>.

- d) Bagged products and containers of jointing and adhesive should be stored in accordance with the manufacturer's instructions and used in date rotation. They should not be opened until required for use and should be used within the stated shelf life. Bagged products should be protected from extremes of temperatures and stored in accordance with the manufacturer's guidance.
- e) Boxed products should be stored in dry conditions and stacked safely.

Figure 1 — *Plasterboard stacked on bearers*



The safe offloading, ingress and storage of materials should be planned in the following stages:

- 1) delivery;
- 2) offloading;
- 3) storage;
- 4) vertical movement, i.e. to upper floors and levels;
- 5) horizontal movement, i.e. across the site or floors; and
- 6) storage at the point of installation.

6.4 Sorting

When dry lining, all specified components and materials should be available at the workplace in good time and in the correct sequence.

6.5 Preparation of work, materials and components

6.5.1 General

All existing finished work and approaches should be protected.

6.5.2 Contractual requirements

All contractual requirements should be checked prior to commencement. The following should be taken into account, as a minimum:

- a) confirmation that a clear programme of works has been produced and is understood;
- b) confirmation that the responsibility for setting out is agreed;
- c) there are satisfactory provisions for the storage of materials;
- d) there are satisfactory provisions for the utility services and lighting required for the erection;
- e) there are arrangements for the clearing of waste, recycling and the protection of work;

- f) there are adequate arrangements for welfare onsite;
- g) relevant risk assessment and method statements (RAMS) have been submitted and approved by the principal contractor prior to commencing work; and
- h) movement of all components and materials is in accordance with current health and safety requirements and any site-relevant conditions.

NOTE Attention is drawn to the Construction (Design and Management) Regulations 2015 [5].

6.5.3 Working conditions

The following should be checked prior to working:

- a) working areas are weatherproof;
- b) first-fix items are in position and complete;
- c) working areas are clean, dry and free from obstruction;
- d) the level of lighting is adequate for the task in hand; and
- e) artificial lighting is provided, if required.

As the direction of light can affect the extent to which inaccuracies might be noticed in the finished work, any lighting used during installation and inspection should simulate the final scheme as closely as possible.

NOTE For more information see [Annex A](#).

6.5.4 Distributed components and materials

When the materials and components are distributed to the work position, the structure should not be overloaded, and advice about any restrictions should be obtained.

6.5.5 Environmental considerations and sustainability

COMMENTARY ON 6.5.5

The Plasterboard Sustainability Partnership (PSP) provides additional information on reducing waste; for more information, see the Plasterboard sustainability action plan report [6]. System owners are able to provide materials to specific sizes and lengths to reduce waste on site. There might be cost and availability implications; the system owner can be consulted for further information.

All plasterboard offcuts that cannot be used elsewhere on the project should be recycled in appropriate recycling schemes.

NOTE Plasterboard waste can be reduced by rationalizing the design to reduce the number of plasterboard types used on a project.

6.6 Checking and handling of materials and components

6.6.1 Checking

Delivery documentation should be checked against the specification and order to establish the correct materials and quantities have been delivered. The marks, labels and condition of materials and components should be examined and, if necessary, the supplier should be notified immediately of any discrepancies. The delivered materials should be checked such that:

- a) all materials and components are clean, undamaged and dry;
- b) gypsum plasterboard sheets are the correct type and have the required dimensions and edge profiles; and
- c) all bagged and tub products are in within their “use by date” and will still be in date at time of use.

Defective materials should not be accepted.

6.6.2 Distribution of plasterboards on site

Plasterboard should not be allowed to get wet.

Plasterboards should be moved in the following ways:

- a) using mechanical aids wherever possible; where this is not possible, allowing for a minimum of two persons to handle a plasterboard (see 7.1.2);

NOTE 1 The FIS Best Practice Guide, "Recommendations for the safe ingress of plasterboard"⁶⁾ provides guidance and recommendations for designers, contractors and specialists on how to plan for the safe ingress and movement of plasterboard.

- b) when plasterboards are lifted manually from a stack, not dragging the plasterboards across the plasterboard surface;

NOTE 2 Dragging plasterboards can cause delamination of paper.

- c) if slings are used for lifting, plasterboards and panels should be stacked on a clean, dry platform so that they do not overhang; slings should be kept away from the plasterboard edges by using spreaders to avoid damage to the edge; and

- d) if transporting plasterboards by crane or forklift, a supporting platform should be used.

7 Design

7.1 Fundamentals of design

7.1.1 Selection of a dry lining system

Before selecting a dry lining system, the designer should determine the performance recommendations as listed in 7.4, and any other project-specific performance and visual design intent recommendations.

Other factors can influence the design of a dry lining system and should be taken into account, including:

- a) type of building, occupancy and use;
- b) thickness of dry lining system;
- c) provision for services;
- d) interface with other building elements and systems;
- e) wall tiling (see 7.7) and finishes (see 7.8);
- f) loadings, including wind loadings;
- g) environmental conditions (see 7.9);
- h) space utilization;
- i) perimeter sealing; and
- j) architectural profiling and detailing.

NOTE Reasons for using dry lining include:

- a) speed and ease of construction;
- b) reduction of wet trades;
- c) easily demounted and adapted;

⁶⁾ Available at <https://www.thefis.org/membership-hub/publications/best-practice-guides/recommendations-for-the-safe-ingress-of-plasterboard/>.

- d) fully recyclable products with high recycled content;
- e) light weight, so imposes less load on the structure;
- f) less temperature-dependent programming; and
- g) space saving.

7.1.2 Health and safety

7.1.2.1 General

General recommendations on workmanship given in [BS 8000-0:2014+A1:2024](#), Clause 2, should be followed.

NOTE Attention is drawn to the Construction (Design and Management) Regulations 2015 [5] for duties imposed on the client, principal designer and designer in the pre-construction phase.

7.1.2.2 Plasterboard handling

The designer should undertake a design risk assessment on the handling of plasterboard and other dry lining system components when selecting plasterboard sizes and proprietary systems, including assessment of site access and means of handling within the site.

NOTE The GPDA Manual handling guide [7] provides information on how designers and contractors can contribute to the safe handling of plasterboard.

7.1.3 Design development

7.1.3.1 General

Specification of performance requirements is generally undertaken during technical design development; however, the designer should use the dry lining partition thickness and main attributes to effectively plan layouts at the spatial coordination stage.

NOTE 1 Works stage guidance is available in the RIBA Plan of work [8].

If the dry lining is subject to a contractor's design portion, a performance specification should be provided. If full design is required, dry lining systems should be selected and specified by the designer to meet performance and other design requirements.

NOTE 2 A performance specification includes design intent information for visual appearance as well as performance requirements.

Where a specific project system or detail is developed, the system should be tested to demonstrate compliance with the performance requirements.

7.1.3.2 Demonstration of system performance

Evidence of laboratory testing demonstrating compliance with performance requirements and carried out to the appropriate test standards, or an assessment where allowed, should be provided by the system owner.

NOTE Further information on best practice for assessments is provided in the Passive Fire Protection Federation's (PFPF) guide to undertaking technical assessments of the fire performance [9] of construction products based on fire test evidence.

Changes to the design and specification of tested dry lining systems might negate test evidence and should be avoided without consultation with the system owner.

Any proposed deviation from the tested system, such as substitution of components or installation parameters, should request input from the system owner on whether the proposal can be supported.

7.1.4 Use of Building Information Modelling (BIM)

The use of BIM in construction projects should be in accordance with [BS 8000-0:2014+A1:2024](#), Annex C.

7.2 Types of dry lining systems

7.2.1 General

Generic dry lining systems are described below; the system owners should be consulted to select the system that meets project requirements.

7.2.2 Partitions

7.2.2.1 Single frame

Single rows of metal studs should be positioned at the required centres in metal head and base channels.

NOTE A “C” or “I” stud profile frame with one or multiple layers of plasterboard fixed to the frame to create a partition.

Single rows of timber studs should be fixed to timber horizontal heads and sole plates.

Single or multiple layers of plasterboard should be attached to both sides of the studs, using mechanical fixings, taped and sealed at joints, allowing for finishing.

Insulation within the cavity of the wall should be installed to meet performance requirements.

7.2.2.2 Twin frame

Double rows of metal studs should be positioned in metal head and base channels, which are braced or non-braced.

Double rows of timber studs should be fixed to timber horizontal head and sole plates, which are braced if required.

Single or multiple layers of plasterboard should be attached to the room sides of the studs with the option to install insulation within the cavity of the wall.

7.2.2.3 Curved partitions

COMMENTARY ON 7.2.2.3

A curved partition can be formed using either a single or double row of vertical studs, at reduced centres. Metal framed partitions are installed between notched head and base channels, constructed to form a curve. Timber framed curved partitions generally comprise templated plywood head and base channels. The key limitation to the achievable radius is the ability of the lining plasterboard to accommodate the required curve.

Evidence of curved system performances should be sought from the system owner, as there might be differences between a curved partition/lining and a straight partition/lining test evidence.

Plasterboards should be installed horizontally and fixed to the studs in accordance with the system owner's requirements.

7.2.2.4 Staggered stud system

COMMENTARY ON 7.2.2.4

This comprises a double row of staggered studs slotted within a single head and base channel. This can reduce the overall partition width compared to a standard twin frame.

Staggered rows of studs should be positioned in single head and base channels using spacer clips.

7.2.2.5 Shaft wall

COMMENTARY ON 7.2.2.5

Shaft wall is an asymmetric single frame partition used to form partitions where there is no or limited access to one side of the partition.

Single rows of shaft wall metal studs should be positioned in a single head and base channel. A single layer of specialist plasterboard should be installed between the studs to the shaft side using system components, and plasterboards installed to the accessible side of construction.

7.2.3 Linings

7.2.3.1 Directly bonded dry lining to solid backgrounds

COMMENTARY ON 7.2.3.1

Directly bonded plasterboards to solid backgrounds do not require metal framing and help to maximize usable room space.

Single layers of plasterboard and thermal laminate plasterboard should be attached to dry, solid backgrounds using a plasterboard adhesive approved by the system owner. The thickness of the adhesive should allow for tolerances of the background.

Backgrounds should be structurally adequate to carry the weight of linings and their fixtures. Where backgrounds are unstable or unsound, alternative lining systems should be used.

NOTE These systems are suitable for single plasterboard heights only, unless agreed with the system owner.

7.2.3.2 Metal furring systems

COMMENTARY ON 7.2.3.2

Metal furring is bonded to solid backgrounds. Plasterboard is then mechanically fixed to the metal furrings using drywall screws.

Metal furrings should be attached to dry, solid backgrounds using a plasterboard adhesive approved by the system owner. The thickness of the adhesive should allow for tolerances of the background.

Single layers of plasterboard and thermal laminate plasterboard should be attached to the metal furring using drywall screws. The length of the drywall screws should be selected such that they do not come into contact with the background.

7.2.3.3 Background supported lining system

COMMENTARY ON 7.2.3.3

A background supported lining system comprises metal channels fixed to the solid background using brackets. Plasterboard is then mechanically fixed to the metal framing using drywall screws. This system allows for deeper offsets to accommodate more pronounced irregularities in the background.

Vertical metal channels should slot into head and base channels and should be attached to the dry solid background using the system owner's brackets.

Plasterboard or thermal laminate plasterboard should be attached to the metal channels using drywall screws.

NOTE Insulation can also be incorporated into the cavity.

7.2.3.4 Independent lining system

COMMENTARY ON 7.2.3.4

An independent lining system comprises a metal or timber frame with vertical studs. Independent lining systems are used where there is no suitable structural background to brace the framework back to, or for performance reasons.

Rows of metal studs should be positioned in metal head and base channels offset from the background.

Rows of timber studs should be fixed to timber horizontal head and sole plates offset from the background.

Single or multiple layers of plasterboard should be attached to the room side of the studs.

Plasterboard or thermal laminate plasterboard should be attached to the metal channels using drywall screws.

NOTE Insulation can also be incorporated into the cavity.

7.2.4 Framed encasement for structural steel fire protection

COMMENTARY ON 7.2.4

Framed encasement systems comprise plasterboard cladding on a metal frame.

Specialist steel framing clips should be fixed to structural “I” beams and “I” columns at designated centres to provide supporting background for channels.

NOTE Other methods of fixing to steel structures are available.

7.2.5 Encasements to structural beams/columns

Where partitioning formed from dry lining is interfaced with structural beams or columns that have been fire protected with a reactive coating, the designer should take into account the impact of the partition on the ability of the reactive coating to expand and fire protect the beams and columns.

Additionally, the designer should take into account the overall performance of the elements forming the compartment line, i.e. the ambient state deflection, and the fire state deflection, acoustics, fire resistance and fire insulation across the elements of the partition and the structural beam.

7.3 Types of ceilings

COMMENTARY ON 7.3

Dry lining ceilings comprise concealed grids or are directly fixed to a structure. The primary functions of a dry lining ceiling are to:

- a) hide services and structural elements;*
- b) provide a surface ready for decoration; and*
- c) contribute to the overall performance of the element to which it is attached.*

7.3.1 Direct applied

COMMENTARY ON 7.3.1

A direct applied ceiling system comprises one or more layers of plasterboard, which could include insulated composite plasterboard fixed directly to the structural substrate using suitable mechanical fixings.

Directly applied plasterboard systems should be installed perpendicular to the direction of joists. Manufacturers' recommendations for installation should be followed.

The system owner should be consulted where fire, acoustic, thermal and structural performance is required.

NOTE 1 Common types of joists include solid and/or engineered joist/truss types.

NOTE 2 Resilient bars can be introduced between the lining and the structure, sometimes referred to as a semi-direct system.

If required, noggings should be installed at ceiling perimeters and within the field of the ceiling in accordance with the system owner's requirements.

7.3.2 Suspended

COMMENTARY ON 7.3.2

A suspended ceiling comprises one or more layers of plasterboard, which could include insulated composite plasterboard fixed to a metal suspension system. The suspension system is fixed to the structural substrate using suitable mechanical fixings.

The positioning of the hangers and metal channels forming the substructure differ depending on the loading applied and size of plasterboard sheet being installed.

Fixings should be specified to take the required suspended or concealed ceiling load, using the process specified in the FIS CFA Best practice guide: Selection and installation of top fixings for suspended ceilings [N1].

The top fixings should be selected using the following information:

- a) load;
- b) structure;
- c) substrate;
- d) environmental conditions;
- e) redundancy requirements of the grid; and
- f) fixing load capacity in accordance with [BS 8539](#).

Plasterboards should be installed with the long edge perpendicular to the direction of the suspension channel/joist system to which the plasterboards are to be fixed, in accordance with manufacturers' recommendations.

7.4 Performance of dry lining systems

7.4.1 General

Performance requirements should be included in the performance specification.

NOTE 1 The properties of different types of plasterboard when manufactured and tested in accordance with [BS EN 520](#) do not confirm system performance. [BS EN 520](#) specifically states that any system performance is defined by testing carried out to the appropriate test standard.

NOTE 2 Changing the specification of components or methods of installation of a tested system can render the tested performance characteristics void unless the adapted system is tested and has passed the test or is deemed to be within the direct or extended field of application. The system owner can be contacted for clarification and more information.

7.4.2 Fire resistance of partitions, wall linings and ceilings

The designer should specify the appropriate fire resistance testing standard from the list below, as variations can exist between standards and lead to confusion:

- a) BS 476-20: *Fire tests on building materials and structures – Part 20: Method for determination of the fire resistance of elements of construction (general principles);*
- b) [BS 476-21](#): *Fire tests on building materials and structures – Part 21: Methods for determination of the fire resistance of load-bearing elements of construction;*
- c) [BS 476-22](#): *Fire tests on building materials and structures – Part 22: Methods for determination of the fire resistance of non-load-bearing elements of construction;*
- d) [BS 476-23](#): *Fire tests on building materials and structures – Part 23: Methods for determination of the contribution of components to the fire resistance of a structure;*
- e) [BS EN 1364-1](#): *Fire resistance tests for non-loadbearing elements – Part 1: Walls;*
- f) [BS EN 1364-2](#): *Fire resistance tests for non-loadbearing elements – Part 2: Ceilings;*
- g) [BS EN 1365-1](#): *Fire resistance tests for loadbearing elements – Part 1: Walls; and*
- h) [BS EN 1365-2](#): *Fire resistance tests for loadbearing elements – Part 2: Floors and roofs.*

NOTE For example, allowable partition height can vary according to which standard is specified.

7.4.3 Fire protection of structural elements

Where plasterboards are used for structural steel beam or column encasement to provide fire protection to the element of structure, the designer should specify the fire protection required and the limiting temperature to which the steel should be protected for the proposed period.

NOTE 1 Plasterboard type, number of layers and thickness requirements depend on the size, weight and profile of the steel section and the number of faces of the steel section to be fire protected. This can vary for different beams and columns forming part of the same structure.

NOTE 2 Some fire protection encasement systems require a void between the back of plasterboard and the steelwork being protected.

NOTE 3 Where other forms of fire protection are applied to steel sections, such as intumescent paints, the overall performance of the system cannot be cumulative, i.e. 30 min fire protection by coating plus 30 min fire protection by plasterboarding does not equate to 60 min fire protection, unless test data is available from the system owner.

Where plasterboards are installed around structural steel components treated with reactive coating (intumescent paint), the following should be consulted:

- a) fire consultant or architect responsible for the fire strategy on the project;
- b) acoustic consultant or architect responsible for the acoustic strategy on the project;
- c) dry lining system owner;
- d) reactive coating manufacturer; and
- e) structural engineer, regarding critical temperatures.

The system owner should be consulted regarding specific system testing.

7.4.4 Reaction to fire

The designer should specify the classification of a given product in accordance with [BS EN 13501-1](#).

7.4.5 Partition and independent lining system height

The Gypsum Products Development Association (GPDA) recommends that the limiting lateral deflection of a system should not exceed $L/240$, where L is the system height when the system is uniformly loaded to a pressure of 200 Pa (the cold state height), unless a stiffer background is required by the applied finishes specification. However, lower limit states and uniformly loaded pressure can be achieved subject to consultation with the system owner and structural engineer.

NOTE 1 The limiting level of mid-height lateral deflection of $L/240$ is considered as the serviceability limit state and is suitable for most painted or plastered finishes.

NOTE 2 Where the system is required to provide a level of robustness in accordance with BS 5234-2, this prescribes that the duty rating claim of the system does not exceed maximum height of the system sample that achieved the relevant Duty Rating.

NOTE 3 Other design considerations that can affect maximum heights include:

- brittle finishes;
- fire resistance - cold state vs fire state;
- different levels of uniformly distributed load [UDL] and maximum acceptable deflection;
- loads/crowd pressures; and
- impact loads.

7.4.6 Ability to accommodate movement

7.4.6.1 General

All forms of building movement can affect dry lining system performance and all predicted movements should be included in the design specification.

NOTE In high-rise buildings, variable wind pressure/loading and vortex shedding can cause the whole structure to drift or sway, causing structural deformation, which can cause racking stresses to the non-load-bearing partitions and can create noise.

7.4.6.2 Provision of movement joints

Designers should allow for the inclusion of movement joints at 10 m intervals in long and continuous partitions, wall linings and ceiling linings. Movement joints should also be incorporated to coincide or relate to movement joints in structural elements with no direct bridging of mechanical parts of the system, and where temperature differences along the length of the partition interface with the substructure might cause differential movement of the wall.

Where dry lining abuts other systems where there is expected movement, e.g. curtain walling, this should be accommodated with movement joint detailing.

7.4.6.3 Vertical movement

Where partitions and linings are fixed to structural soffits subject to vertical movement, a deflection head detail should be included.

Only the system owner's standard deflection details that have been tested to demonstrate compliance with relevant performance requirements should be used.

Predicted deflection should be specified by the designer, and minimum engagement of the studs determined by the system owner such that the head detail does not lose performance.

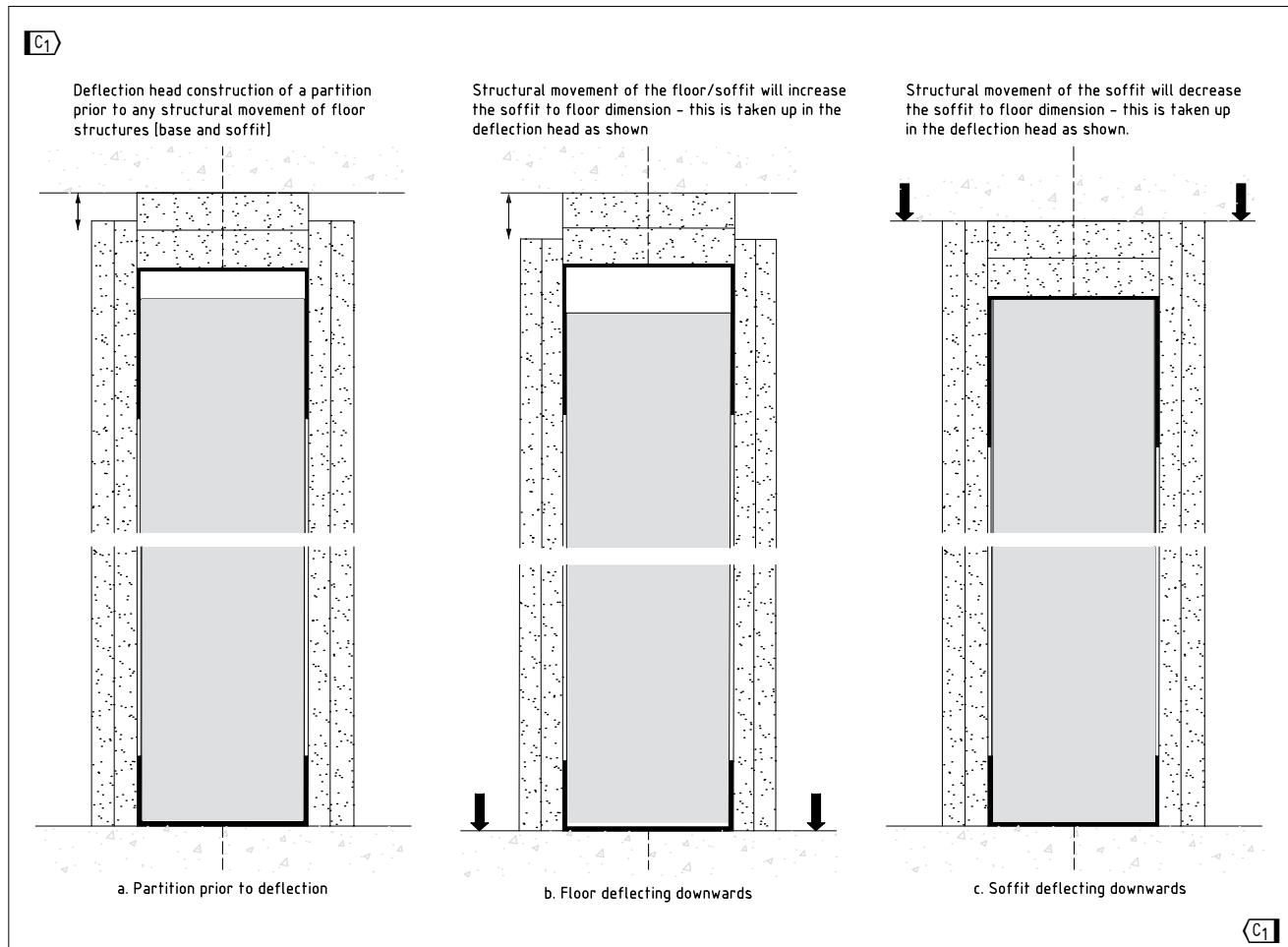
NOTE 1 Predicted deflection includes dead load deflection, live load deflection and long-term deformation due to building settlement and creep. Movement can increase or decrease dimensions within a space. This is expressed as plus/minus and also as $\pm$.

NOTE 2 All of these factors can influence the choice/depth of the head channels to be used.

NOTE 3 Deflection head details are not available when timber studs are used.

NOTE 4 Figure 2 illustrates the types of plus/minus and $\pm$ movement.

Figure 2 — Typical head details of partitions to accommodate vertical deflection of the structural element



The system owner should be consulted so that the deflection head detailing can maintain all the system's performance requirements.

NOTE 5 The deflection head detail can have a potentially detrimental effect on air permeability and the acoustic performance of a partition or lining.