Development & Planning Authority

Guernsey Technical Standard

Structure

The Building (Guernsey) Regulations, 2012

A

A1 Loading
A2 Ground movement
A3 Disproportionate collapse
A4 Swimming pools and reservoirs

2017 edition

MAIN CHANGES IN THE 2017 EDITION

1. This Guernsey Technical Standard which takes effect on 1st June 2017 is issued under the Building (Guernsey) Regulations, 2012. From this date the previous 2012 edition as amended in 2013 and 2016, will no longer be valid except in relation to building work carried out in accordance with full plans deposited with the States of Guernsey Building Control before that date.

2. The main changes in this document are to:

   a) Guidance on where to obtain the sizing of timber members included

   b) Guidance in relation to longhorn beetle has been included although not an identified problem on Guernsey at this time

   c) References to British design standards updated to Eurocodes

   d) Guidance on disproportionate collapse updated

   e) Guidance on strip footings amended

How this Guernsey Technical Standard A differs from the UK Approved Document A

3. In addition to the different legislative references reflecting Guernsey legislation, the main differences a non resident based applicant should note is additional functional requirement A4 'Swimming pools and reservoirs'

4. Diagrams in relation to national wind speeds and maximum height for buildings referred to in the UK document 2C16 are replaced with a text only statement in 2B16

5. The UK Building (Approved Inspectors, etc.) Regulations 2010 are not in force in Guernsey. Therefore approved inspectors are not recognised on the Island and all references have been removed.

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Introduction

What is a Guernsey Technical Standard?

This document has been approved and issued by the Development and Planning Authority to provide practical guidance on ways of complying with requirements A1 to A4 and regulation 11 of the Building (Guernsey) Regulations, 2012 (GSI 2012 No.11) . The Building (Guernsey) Regulations, 2012 are referred to throughout the remainder of this document as 'the Building Regulations'.

The intention of issuing Guernsey Technical Standards is to provide guidance about compliance with specific aspects of the Building Regulations in some of the more common building situations. They include examples of what, in ordinary circumstances, may be reasonable provision for compliance with the relevant requirement(s) of the Building Regulations to which they refer.

If guidance in a Guernsey Technical Standard is followed this may be relied upon as tending to show compliance with the requirement(s) covered by the guidance. Similarly a contravention of the standard may be relied upon as tending to establish a breach of the requirements. However, this is not conclusive, so simply following guidance does not guarantee compliance in an individual case or a failure to follow it meaning that there is necessarily a breach. It is also important to note that there may well be other ways of achieving compliance with the requirements. There is therefore no obligation to adopt any particular solution contained in this Guernsey Technical Standard if you would prefer to meet the relevant requirement in some other way. However, persons intending to carry out building work should always check with Building Control, that their proposals comply with Building Regulations.

The guidance contained in this Guernsey Technical Standard relates only to the particular requirements of the Building Regulations that the document addresses, (see 'Requirements' below). However, building work may be subject to more than one requirement of the Building Regulations and there may be an obligation to carry out work on a material change of use. In such cases the works will also have to comply with any other applicable requirements of the Building Regulations and work may need to be carried out which applies where a material change of use occurs.

This document is one of a series that has been approved and issued for the purpose of providing practical guidance with respect to the requirements of the Building Regulations in particular of regulations 6, 8 and 11 and Schedule 1.

At the back of this document is a list of all the documents that have been approved and issued for this purpose.

How to use this Guernsey Technical Standard

In this document the following conventions have been adopted to assist understanding and interpretation:

a. Texts shown against a yellow background are extracts from the Building Regulations, and set out the legal requirements that relate to compliance with the **structure** requirements of the Building Regulations. It should be remembered however that, as noted above, building works must comply with all the other applicable provisions of the Building Regulations.

b. Key terms are defined in annex B at the rear of this document.

c. Details of technical publications referred to in the text of this document will be presented in ***italics*** and repeated in standards referred to as an annex at the rear of this document. A reference to a publication is likely to be made for one of two main reasons. The publication may contain additional or more comprehensive technical detail, which it would be impractical to include in full in this Document but which is needed to fully explain ways of meeting the requirements; or it is a source of more general information. The reason for the reference will be indicated in each case. The reference will be to a specified edition of the document. The Guernsey Technical Standard may be amended from time to time to include new references or to refer to revised editions where this aids compliance.

Where you can get further help

If you require clarification of any of the technical guidance or other information set out in this Guernsey Technical Standard and the additional detailed technical references to which it directs you, there are a number of routes through which you can seek further assistance:

– The States of Guernsey website: **www.gov.gg/planning**

– If you are the person undertaking the building work you can seek advice from Building Control Surveyors to help ensure that, when carried out, your work will meet the requirements of the Building Regulations.

– Businesses registered with a competent person self-certification scheme may be able to get technical advice from their scheme operator. A full list of competent persons schemes are included as Schedule 3 of the Building Regulations.

– If your query is of a highly technical nature you may wish to seek the advice of a specialist, or industry technical body, in the area of concern.

Responsibility for compliance

It is important to remember that if you are the person (e.g. designer, builder, installer) carrying out building work to which any requirement of Building Regulations applies you have a responsibility to ensure that the work complies with any such requirement. The building owner or occupier will also have a responsibility for ensuring compliance with Building Regulation requirements and could be served with a compliance notice in cases of non-compliance or with a challenge notice in cases of suspected non-compliance.

General Guidance

Types of work covered by this Guernsey Technical Standard

Building work

Building work, as defined in regulation 5 of the Building (Guernsey) Regulations, 2012, includes the erection or extension of a building, the provision or extension of a controlled service or fitting, and the material alteration of a building or a controlled service or fitting. In addition, the Building Regulations may apply in cases where the purposes for which, or the manner or circumstances in which, a building or part of a building is used change in a way that constitutes a material change of use.

Under regulation 6 of the Building Regulations 2012, building work must be carried out in such a way that, on completion of work,

i. the work complies with the applicable Parts of Schedule 1 of the Building Regulations,

ii. in the case of an extension or material alteration of a building, or the provision, extension or material alteration of a controlled service or fitting, it complies with the applicable Parts of Schedule 1 to the Building Regulations and also does so as satisfactorily as it did before the work was carried out.

Work described in Part A concerns the structure. Work associated with structural elements covered in these sections may be subject to other relevant Parts of the Building Regulations.

Material change of use

A material change of use occurs in specified circumstances in which a building, or part of a building that was previously used for one purpose will be used in future for another, or is converted to a building of another kind. Where there is a material change of use, the Building Regulations set requirements that must be met before the building can be used for its new purpose.

Regulation 7 of the Building (Guernsey) Regulations, 2012 specifies the following circumstances as material changes of use:

- a building is used as a dwelling where previously it was not,
- a building contains a flat where previously it did not,
- a building is used as an institution where previously it was not,
- a building is used as a public building where previously it was not,
- a building is not described in Classes I to V or VI of Schedule 2, where previously it was,
- a building contains a room for residential purposes where previously it did not,
- a building contains an office where previously it did not,
- a building is used as an hotel or guest house, where previously it was not,
- a building is an industrial building, where previously it was not,
- a building contains a shop, where previously it did not,
- a building is used for the sale of food or drink, to the public in the course of a business and for consumption in that building and where there is a maximum capacity of 15 or more persons seated or standing, where previously it was not so used,
- the building, which contains at least one room for residential purposes, contains a greater or lesser number of such rooms than it did previously,
- the building, which contains at least one dwelling, contains a greater or lesser number of dwellings than it did previously.

Part A1 will apply to all the material changes of use mentioned above. This means that whenever such changes occur the building must be brought up to the standards required by Parts A1.

Parts A2 and A3 will apply only to material changes of use where a building is used as an institution where previously it was not, a building is used as a public building where previously it was not, a building is not described in Classes I to VII of

Schedule 2, where previously it was, a building is used as an hotel or guest house, where previously it was not and where a building is an industrial building, where previously it was not.

Part A3 also applies where a building contains a flat where previously it did not.

Protected Buildings and Monuments

The types of building works covered by this Guernsey Technical Standard may include work on historic buildings. Historic buildings include:

a. a building appearing on the protected buildings listing

b. a building or other structure appearing on the protected monument listing

When exercising its functions under The Land Planning and Development Law, the States has duties under s30(1), 34, 35 and 38(1) of that Law, to secure so far as possible that monuments are protected and preserved, that the special characteristics of protected buildings are preserved and to pay special attention to the desirability of preserving and enhancing the character and appearance of a conservation area. Building Control will need to comply with these duties when considering any decisions in relation to such buildings or buildings in such areas.

Special considerations may apply if the building on which the work is to be carried out has special historic, architectural, traditional or other interest, and compliance with the **structure** requirements would unacceptably alter the fabric, character or appearance of the building or parts of it.

When undertaking work on or in connection with buildings with special historic, architectural, traditional or other interest, the aim should be to improve the **structure** where and to the extent that it is possible provided that the work does not prejudice the fabric, character or appearance of the host building or increase the long-term deterioration to the building's fabric or fittings.

In arriving at a balance between historic building conservation and the **structure** requirements advice should be sought from the historic building adviser.

Note: Any building which is a protected monument listed under Section 29 of The Land Planning and Development (Guernsey) Law 2005 is exempt from most Building Regulations requirements including those in Part A, (See regulation 13 and class V of Schedule 2 to the Building Regulations) unless the proposed works constitute a material change of use.

Notification of work

In almost all cases of new building work it will be necessary to notify Building Control in advance of any work starting. The exception to this: where work is carried out under a self-certification scheme listed in Schedule 3 or where works consist of emergency repairs.

Competent person self-certification schemes under Schedule 3

Under regulations 14(4), 17(4) and 19 of the Building Regulations it is not necessary to deposit plans or notify Building Control in advance of work which is covered by this Guernsey Technical Standard if that work is of a type set out in column 1 of Schedule 3 to the Regulations and is carried out by a person registered with a relevant self-certification (competent persons) scheme as set out in column 2 of that Schedule. In order to join such a scheme a person must demonstrate competence to carry out the type of work the scheme covers, and also the ability to comply with all relevant requirements in the Building Regulations. These schemes may change from time to time, or schemes may change name, or new schemes may be authorised under Schedule 3; the current list on the States's website should always be consulted. Full details of the schemes can be found on the individual scheme websites.

Where work is carried out by a person registered with a competent person scheme, regulation 19 of the Building Regulations requires that the occupier of the building be given, within 30 days of the completion of the work, a certificate confirming that the work complies with all applicable Building Regulation requirements. There is also a requirement that Building Control be given a notice that this has been done, or the certificate, again within 30 days of the completion of the work. These certificates and notices are usually made available through the scheme operator.

Building Control is authorised to accept these certificates as evidence of compliance with the requirements of the Building Regulations. However, inspection and enforcement powers remain unaffected, although they are normally used only in response to a complaint that work may not comply.

Exemptions

Schedule 2 to the Building Regulations sets out a number of classes of buildings which are exempt from majority of Building Regulations requirements including Part A.

Materials and workmanship

Any building work within the meaning of the Building Regulations should, in accordance with regulation 11, be carried out with proper materials and in a workmanlike manner.

You may show that you have complied with regulation 11 in a number of ways. These include the appropriate use of a product bearing CE marking in accordance with the Construction Products Regulation (305/2011/EU-CPR) as or a product complying with an appropriate technical specification (as defined in those Regulations), a British Standard or an alternative national technical specification of any state which is a contracting party to the European Economic Area which in use is equivalent, or a product covered by a national or European certificate issued by a European Technical Approval issuing body, and the conditions of use are in accordance with the terms of the certificate.

You will find further guidance in the Guernsey Technical Standard on materials and workmanship that provides practical guidance on regulation 11 on materials and workmanship.

Supplementary guidance

Building Control occasionally issues additional material to aid interpretation of the guidance in Guernsey Technical Standards. This material may be conveyed in official letters to relevant agents and/or posted on the States website accessed through: **www.gov.gg/planning**

Technical specifications

When a Guernsey Technical Standard makes reference to specific standards or documents, the relevant version of the standard is the one listed at the end of the publication. However, if this version of the standard has been revised or updated by the issuing standards body, the new version may be used as a source of guidance provided that it continues to address the relevant requirements of the Building Regulations.

Where it is proposed to work to an updated version of the standard instead of the version listed at the end of the publication, this should be discussed with Building Control in advance of any work starting on site.

The appropriate use of any product, which complies with a European Technical Approval as defined in the Construction Products Regulation, (305/2011/EU-CPR) as amended, repealed or replaced will meet the relevant requirements.

Independent schemes of certification and accreditation

Much of the guidance throughout this document is given in terms of performance.

Since the performance of a system, product, component or structure is dependent upon satisfactory site installation, testing and maintenance, independent schemes of certification and accreditation of installers and maintenance firms will provide confidence in the appropriate standard of workmanship being provided.

Confidence that the required level of performance can be achieved will be demonstrated by the use of a system, material, product or structure which is provided under the arrangements of a product conformity certification scheme and an accreditation of installer scheme.

Third party accredited product conformity certification schemes not only provide a means of identifying materials and designs of systems, products and structures which have demonstrated that they reach the requisite performance, but additionally provide confidence that the systems, materials, products and structures are actually provided to the same specification or design as that tested or assessed.

Third party accreditation of installers of systems, materials, products and structures provides a means of ensuring that installations have been conducted by knowledgeable contractors to appropriate standards, thereby increasing the reliability of the anticipated performance.

Many certification bodies that approve such schemes are accredited by the **United Kingdom Accreditation Service.**

Certification of products, components, materials or structures under such schemes may be accepted as evidence of compliance with the relevant standard. Similarly the certification of installation or maintenance of products, components, materials and structures under such schemes as evidence of compliance with the relevant standard may be acceptable. Nonetheless Building Control will wish to establish in advance of the work, that any such scheme is adequate for the purpose of the Building Regulations.

Interaction with other legislation

This Guernsey Technical Standard makes reference to other legislation, including that listed below, the requirements of which may be applicable when carrying out building work. All references are to legislation as amended or repealed and replaced.

Note: All Laws, Ordinances and statutory instruments can be accessed at;

www.guernseylegalresources.gg/

The Health and Safety at Work (General) (Guernsey) Ordinance, 1987 made under the Health and Safety at Work etc. (Guernsey) Law, 1979 and the Health, Safety and Welfare of Employees Law, 1950 applies to any workplace or part of a workplace. It applies to the common parts of flats and similar buildings if people such as cleaners, wardens and caretakers are employed to work in these common parts.

Mixed use development

In mixed use developments part of a building may be used as a dwelling while another part has a non-domestic use. In such cases, if the requirements of this Part of the Regulations for dwellings and non-domestic use differ, the requirements for non-domestic use should apply in any shared parts of the building.

OTHER FORMS OF HOUSE CONSTRUCTION

This Guernsey Technical Standard includes guidance on structural elements of residential buildings of traditional masonry construction. It is recognised, however, that there are other suitable forms of construction in use in the housing sector some of which (e.g. timber framed) have been in common use for a number of years and have demonstrated an adequate performance in compliance with the requirements of A1. Such alternative forms include prefabricated timber, light steel and precast concrete framed construction.

A number of guidance documents relating to these alternative forms are presently being developed by industry. The intention is to reference these in this document in future revisions.

BRITISH STANDARDS

British Standards for structural design based upon the Eurocodes implemented by the British Standards Institution on 1st April 2010 are the standards with the UK National Annexes which are now referenced in this Guernsey Technical Standard as practical guidance on meeting Part A requirements.

There may be alternative ways of achieving compliance with the requirements and there might be cases where it can be demonstrated that the use of withdrawn standards no longer maintained by the British Standards Institution continues to meet Part A requirements.

The Requirements A1 & A2

This Guernsey Technical Standard deals with the following requirements from Part A of Schedule 1 to the Building Regulations.

Requirement	*Limits on application*
Loading	
A1. (1) The building must be so constructed that the combined dead, imposed and wind loads are sustained and transmitted by it to the ground- (a) safely, and (b) without causing such deflection or deformation of any part of the building, or such movement of the ground, as will impair the stability of any part of that or another building. (2) In assessing whether a building complies with sub paragraph (1) regard must be had to the imposed and wind loads to which it is likely to be subjected in the ordinary course of its use for the purpose for which it is intended.	
Ground movement	
A2. The building must be constructed so that ground movement caused by- (a) swelling, shrinkage or freezing of the subsoil, or (b) land-slip or subsidence (other than subsidence arising from shrinkage), in so far as the risk can be reasonably foreseen, will not impair the stability of any part of the building.	

Guidance

Performance

A1/2.1 The requirements of A1 and A2 will be met by following the recommendations given in the documents listed in Section 1 or by adopting the guidance in Sections 2-4:

a. Section 1 is relevant to all building types and lists Codes, Standards and other references for structural design and construction but, where they do not give precise guidance, consideration should be given to paragraph A1/2.2.

b. Section 2 give sizes of structural elements for certain residential buildings and other small buildings of traditional construction.

c. Section 3 gives guidance on the support and fixing of wall cladding.

d. Section 4 gives guidance where roofs are to be re-covered as a material alteration as defined in the Regulations.

A1/2.2 The safety of a structure depends on the successful combination of design and completed construction, particularly:

a. The design should be based on identification of the hazards to which the structure is likely to be subjected and assessment of the risks. The selection of relevant critical situations for design should be made reflecting the conditions that can reasonably be foreseen during future use.

b. Loading. Dead load, imposed load and wind load should be in accordance with the current Codes of Practice referred to in Section 1 of this document.

c. Properties of materials.

d. Detailed design and assembly of the structure.

e. Safety factors.

f. Workmanship.

The numeric values of safety factors, whether expressed explicitly or implicitly in design equations, or design values, should be derived from considerations of the above aspects of design and construction as a whole. A change in any one of these aspects may disturb the safety of the structure.

Loads used in calculations should allow for possible dynamic, concentrated and peak load effects that may occur.

A1/2.3 Grandstands and structures erected in places of public assembly may need to sustain the synchronous or rhythmic movement of numbers of people. It is important to ensure that the design of the structure takes these factors into account so as to avoid the structure being impaired or causing alarm to people using the structure.

Guidance on the design and testing of grandstands may be found in *'Dynamic performance requirements for permanent grandstands subject to crowd action - Recommendations for management, design and assessment'* published by The Institution of Structural Engineers, December 2008.

Section 1: Codes, standards and references for all buildings

General

1.1 This section is relevant to all building types and lists codes, standards and other references for structural design and construction.

References

1.2 Basis of structural design and Loading:

Eurocode: Basis of Structural Design

BS EN 1990:2002+A1:2005 Eurocode - Basis for structural design; with UK National Annex to BS EN 1990:2002+A1:2005

Eurocode 1 : Actions on Structures

BS EN 1991-1-1:2002 Eurocode 1: Actions on structures - Part 1.1: General actions - Densities, self weight, imposed loads for buildings; with UK National Annex to BS EN 1991-1-1:2002

BSI PD 6688-1-1:2011 Published Document - Recommendations for the design of structures to BS EN 1991-1-1

BS EN 1991-1-3:2003 Eurocodes 1: Actions on structures - Part 1.3:2003 General actions _ Snow loads; with UK National Annex to BS EN 1991-1-3:2003

BS EN 1991-1-4:2005+A1:2010 Eurocode 1: Actions on structures - Part 1,4: General actions - Wind actions; with UK National Annex to BS EN 1991-1-4:2005+A1:2010

BSI PD 6688-1-4:2009 Published Document - Background information to the National Annex to BS EN 1991-1-4 and additional guidance

BS EN 1991-1-5:2003 Eurocode 1: Actions on structures - Part 1.5: General actions - Thermal actions; with UK National Annex to BS EN 1991-1-5:2003

BS EN 1991-1-6:2005 Eurocode 1: Actions on structures - Part 1.6: General actions - Actions during execution; with UK National Annex to BS EN 1996-1-6:2005

BS EN 1991-1-7:2006 Eurocode 1: Actions on structures - Part 1.7: General actions - Accidental actions; with UK National Annex to BS EN 1991-1-7:2006

BSI PD 6688-1-7:2009 Published Document - Recommendations for the design of structures to BS EN 1991-1-7

BS EN 1991-3:2006 Eurocodes 1: Actions on structures - Part 3: Actions induced by cranes and machinery; with UK National Annex to BS EN 1991-1:2006

1.3 Structural work of reinforced, pre-stressed or plain concrete:

Eurocode 2: Design of Concrete structures

BS EN 1992-1-1:2004 Eurocode 2: Design of concrete structures - Part 1.1: General rules and rules for buildings: with Uk National Annex to BS EN 1992-1-1:2004

BSI PD 6687-1:2010 Published Document - Background paper to the UK National Annes to BS EN 1992-1 and BS EN 1992-3

BS EN 13670:2009 Execution of concrete structures

1.4 Structural work of steel:

Eurocode 3: Design of Steel Structures

BS EN 1993-1-1:2005 Eurocode 3: Design of steel structures - Part 1.1: General rules and rules for buildings; with UK National Annex to BS EN 1993-1-1:2005

BS EN 1993-1-3:2006 Eurocode 3: Design of steel structures - Part 1.3: General rules - Supplementary rules for cold-formed members and sheeting;with UK National Annex to BS EN 1993-1-3:2006

BS EN 1993-1-4:2006 Eurocode 3: Design of steel structures - Part 1.4: General rules - Supplementary rules for stainless steels; with UK National Annex to BS EN 1993-1-4:2006

BS EN 1993-1-5:2006 Eurocode 3: Design of steel structures - Part 1.5: Plates structural elements; with UK National Annex to BS EN 1993-1-5:2006

BS EN 1993-1-6:2007 Eurocode 3: Design of steel structures - Part 1.6: Strength and stability of shell structures

BS EN 1993-1-7:2007 Eurocode 3: Design of steel structures - Part 1.7: Plated structures subject to out of plane loading

BS EN 1993-1-8:2005 Eurocode 3: Design of steel structures - Part 1.8: Design of joints; with UK National Annex to BS EN 1993-1-8:2005

BS EN 1993-1-9:2005 Eurocode 3: Design of steel structures - Part 1.9: Fatigue; with UK National Annex to BS EN 1993-1-9:2005

BSI PD 6695-1-9:2008 Published Document - Recommendations for the design of structures to BS EN 1993-1-9

BS EN 1993-1-10:2005 Eurocode 3: Design of steel structures - Part 1.10: Material toughness and through-thickness properties; with UK National Annex to BS EN 1993-1-10:2005

BSI PD 6695-1-10:2009 Published Document - Recommendations for the design of structures to BS EN 1993-1-10

BS EN 1993-1-11:2006 Eurocode 3: Design of steel structures with tension components; with UK National Annex to BS EN 1993-1-11:2006

BS EN 1993-1-12:2007 Eurocode 3: Design of steel structures - Part 1.12: Additional rules for the extension of EN 1993 up to steel grades S 700; with UK National Annex to BS EN 1993-1-12:2007

BS EN 1993-5:2007 Eurocode 3: Design of steel structures - Part 5: Piling; with UK National Annex to BS EN 1993-5:2007+A1:2012

BS EN 1993-6:2007 Eurocode 3: Design of steel structures - Part 6: Crane supporting structures; with UK National Annex to BS EN 1993-6:2007

BS EN 1090-2:2008+A1:2011 Execution of steel structures and aluminium structures - Part 2: Technical requirements for the execution of steel structures

BRE Digest 437 Industrial platform floors: mezzanine and raised storage.

1.5 Structural work of composite steel and concrete:

Eurocode 4: Design of composite Steel and Concrete Structures

BS EN 1994-1-1:2004 Eurocode 4 Design of composite steel and concrete structures - Part 1.1: General rules and rules for buildings; with UK National Annex to BS EN 1994-1-1:2004

1.6 Structural work of timber:

Eurocode 5: Design of Timber Structures

BS EN 1995-1-1:2004+A1:2008 Eurocode 5: Design of timber structures - Part 1.1: General - Common rules and rules for buildings; with UK National Annex to BS EN 1995-1-1:2004+A1:2008

BSI PD 6693-1:2012 Published Document - Recommendations for the design of timber structures to Eurocode 5: Design of timber structures Part 1: General - Common rules and rules for buildings

BS 8103-3:2009: Code of practice for timber floors and roofs for housing

1.7 Structural work of masonry:

Eurocode 6: Design of Masonry Structures

BS EN 1996-1-1:2005+A1:2012 Eurocode 6: Design of masonry structures - Part 1.1: General rules for reinforced and unreinforced masonry structures; with UK National Annex to BS EN 1996-1-1:2005+A1:2012

BS EN 1996-2:2006 Eurocode 6: Design of masonry structures - Part 2: Design considerations, selection of materials and execution of masonry; with UK National Annex to BS EN 1996-2:2006

BSI PD 6697:2010 Published Document - Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2

BS EN 1996-3:2006 Eurocode 6: Design of masonry structures - Part 3: Simplified calculation methods for unreinforced masonry structures; with UK National Annex to BS EN 1996-3:2006

BS 8103-1:2011 Structural design of low-rise buildings - Part 1: Code of Practice for stability, site investigation, foundations, precast concrete floors and ground floor slabs for housing

BS 8103-2:2005 Structural design of low-rise buildings - Part 2: Code of practice for masonry walls for housing

1.8 Geotechnical work and foundations:

Eurocode 7: Geotechnical Design

BS EN 1997-1:2004 Eurocode 7: Geotechnical design - Part 1: General rules; with UK National Annex to BS EN 1997-1:2004

BS EN 1997-2:2007 Eurocode 7: Geotechnical design - Part 2: Ground investigation and testing; with UK National Annex to BS EN 1997-2:2007

1.9 Seismic aspects:

Eurocode 8: Design of Structures for Earthquake resistance

BS EN 1998-1:2004+A1:2013 Eurocode 8: Design of structures for earthquake resistance - Part 1: General rules, seismic actions and rules for buildings; with UK National Annex to BS EN 1998-1:2004

BS EN 1998-5:2004 Eurocode 8: Design of structures for earthequake resistance - Part 5: Foundations, retaining structures and geotechnical aspects; with UK National Annex to BS EN 1998-5:2004

BSI PD 6698:2009 Published Document - Recommendations for the design of structures for earthquake resistance to BS EN 1998

1.10 Structural work of aluminium:

Eurocode 9: Design of Aluminium Structures

BS EN 1999-1-1:2007+A1:2009 Eurocode 9: Design of aluminium structures - Part 1.1: General structural rules; with UK National Annex to BS EN 1999-1-1:2007+A1:2009

BS EN 1999-1-3:2007+A1:2011 Eurocode 9: Design of aluminium structures - Part 1.3: Structures susceptible to fatigue; with UK National Annex to BS EN 1999-1-3:2007+A1:2011

BSI PD 6702-1:2009 Published Document - Structural use of aluminium - Part 1: Recommendations for the design of aluminium structures to BS EN 1999

BS EN 1999-1-4:2007+A1:2011 Eurocode 9: Design of aluminium structures - Part 1.4: Cold-formed structural sheeting; with UK National Annex to BS EN 1999-1-4:2007

BS EN 1999-1-5:2007 Eurocode 9: Design of aluminium structures - Part 1.5: Shell structures; with UK National Annex to BS EN 1999-1-5:2007

BS EN 1090-3:2008 Execution of steel structures and aluminium structures - Part 3: Technical requirements for aluminium structures

BSI PD 6705-3:2009 Published Document - Structural use of steel and aluminium - Part 3: Recommendations for the execution of aluminium structures to BS EN 1090-3

Ground movement

(Requirement A2b)

1.11 There may be known or recorded conditions of ground instability, such as that arising from landslides, disused quarries or unstable strata which, if ignored, can have a devastating effect on the safety of a building and its environs. Such conditions should be taken into account in the design of the building and its foundations. Attention is drawn to *Planning Policy GP17: Public Safety and Hazardous Development, of the Island Development Plan 2016* when considering sites with the potential for significant risk to public health and safety , and the environment.

Existing buildings

1.12 Compliance with Part A (Structure) is required in certain classes of change of use of a building, subject to the control of regulations 7 and 8 of the Building Regulations. Guidance relevant to structural appraisals related to 'change of use' is given in the following documents:

a. *BRE Digest 366: Structural Appraisal of Existing Buildings,Including for a Material Change of Use, 2012*

b. *The Institution of Structural Engineers Technical Publication Appraisal of Existing Structures (third edition), 2010*.

Note: With reference to 'design checks' in the above referenced Institution of Structural Engineers Technical Publication the choice of various partial factors should be made to suit the individual circumstances of each case.

Section 2: Sizes of structural elements for certain residential buildings and other small buildings of traditional construction

General

2.1 This section is presented as follows:

Section 2A

Basic requirements for stability.

Section 2B

Sizes of certain timber members in floors and roofs for dwellings.

Areas at risk from house longhorn beetle.

Section 2C

Thickness of masonry walls in certain residential buildings of not more than three storeys, small single-storey non-residential buildings and annexes.

Section 2CD

Proportions for masonry chimneys.

Section 2E

Foundations of plain concrete.

2.2 Section 2A gives general rules which must be observed in following Section 2B and 2C. Sections 2B to 2E may be used independently of each other.

Throughout this section the diagrams are only illustrative and do not show all the details of construction.

Note: For definitions of terms used throughout this section refer to **Annex B - Key Terms**

Section 2A: Basic requirements for stability

2A1 This section must be used in conjunction with section 2B and 2C and its principles relate to all forms of low-rise residential buildings.

2A2 Adequate provision must be made to ensure that the building is stable under the likely imposed and wind loading conditions. This will commonly necessitate meeting the following requirements:

a. That the overall size and proportioning of the building are limited in accordance with the specific guidance for each form of construction.

b. That a suitable layout of walls (both internal and external) forming a robust 3 dimensional box structure in plan is constructed with restriction on the maximum size of cells measured in accordance with the specific guidance for each form of construction.

c. That the internal and external walls are adequately connected either by masonry bonding or by using mechanical connections.

d. That the intermediate floors and roof are of such construction and interconnection with the walls that they provide local support to the walls and also act as horizontal diaphragms capable of transferring the wind forces to buttressing elements of the building.

Note: A traditional cut timber roof (i.e. using rafters, purlins and ceiling joists) generally has sufficient built in resistance to instability and wind forces (e.g. from hipped ends, tiling battens, rigid sarking or the like). However, the need for diagonal rafter bracing equivalent to that recommended in *BS EN 1995-1-1:2004 with its UK National Annex* and additional guidance given in *BSI Published Document PD 6693-1:2012 and BS 8103-3:2009* for trussed rafter roofs should be considered especially for single-hipped and non-hipped roofs of greater than 40° pitch to detached houses.

Section 2B: Sizes of certain timber members in floors and roofs for dwellings. Areas at risk from house longhorn beetle

Sizing of Members

2B1 Guidance on the sizing of certain members in floors and roofs is given in *'Span tables for solid timber members in floors, ceilings, and roofs (excluding trussed rafter roofs) for dwellings',* published by TRADA, available from Chiltern House, Stocking Lane, Hughenden Valley, High Wycombe, Bucks HP14 4ND

Alternative guidance is available in *BS EN 1995-1-1:2004 Design of timber structures with its UK National Annex and additional guidance given in BSI Published Document PD 6693-1:2012* and also *BS 8103-3:2009 Structural design of low-rise buildings, Code of practice for timber floors and roofs for housing*.

House longhorn beetle

2B2 Although not yet identified in Guernsey, if/when this becomes an issue, softwood timber for roof construction or fixed in the roof space, including ceiling joists within the void spaces of the roof, should be adequately treated to prevent infestation by the house longhorn beetle (Hylotrupes bajulus L.).

Guidance on suitable preservative treatments is given within The Wood Protection Association's manual *'Industrial Wood Preservation: Specification and Practice' (2010),* available from 5C Flemming Court, Castleford, West Yorkshire, WF10 5HW

Section 2C: Thickness of walls in certain small buildings

Application

2C1 This section applies to the following building types:

a. residential buildings of not more than three storeys;

b. small single-storey non-residential buildings;

c. small buildings forming annexes to residential buildings (including garages and outbuildings).

Wall types

2C2 Only the types of wall given in **Table 1**, which must extend to the full storey height, and parapet walls are considered in this section.

The use of this section

2C3 When using this section it should be noted that:

a. this section must be used in conjunction with Section 2A;

b. if wall thickness is to be determined according to paragraphs 2C5 to 2C13, all appropriate design conditions given in this section must be satisfied;

c. walls should comply with the relevant requirements of *BS EN 1996-2:2006 with its UK National Annex and additional guidance given in BSI Published Document PD 6697:2010*, except as regards the conditions given in paragraphs 2C4 and 2C14 to 2C38;

d. in formulating the guidance of this section the worst combination of circumstances likely to arise was taken into account. If a requirement of this part is considered too onerous in a particular case it may be appropriate to consider a minor departure on the basis of judgement and experience, or to show adequacy by calculation in respect of the aspect of the wall which is subject to the departure rather than for the entire wall;

e. the guidance given is based upon the compressive strengths of bricks and blocks being not less than indicated in Tables 5 and 6.

BS EN 1996-1-1:2005 with it UK National Annex gives design strengths for walls where the suitability for use of masonry units of other compressive strengths is being considered.

Table 1 **Wall types considered in this section**

Residential buildings of up to three storeys
External walls
Internal load-bearing walls
Compartment walls
Separating walls
Small single-storey non-residential buildings and annexes
External walls
Internal load-bearing walls

Conditions relating to the building of which the wall forms part

2C4 This Section applies only to buildings having proportions within the following parameters (see Diagrams 1 and 2):

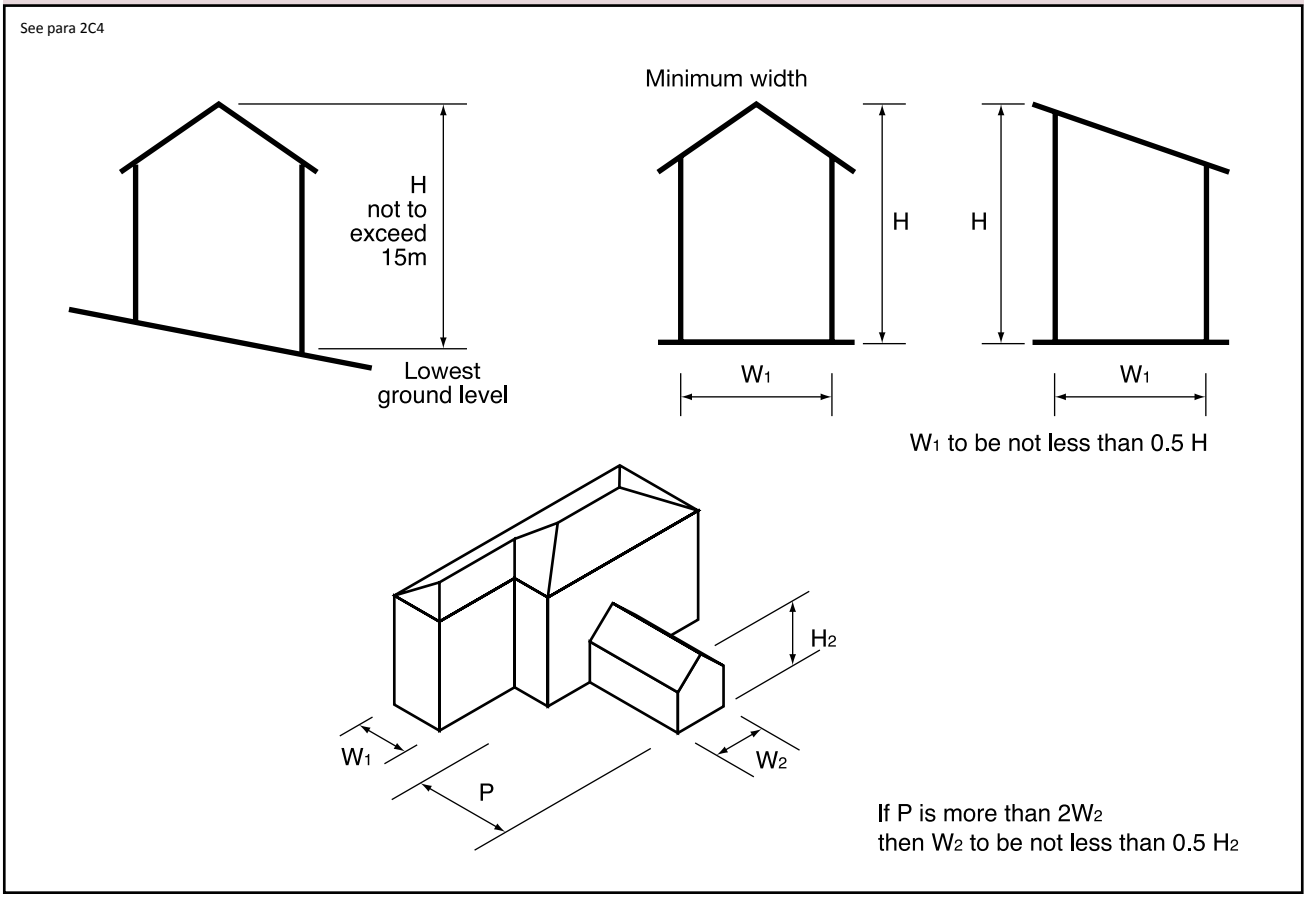
a. residential buildings of not more than three storeys:

i. the maximum height of the building measured from the lowest finished ground level adjoining the building to the highest point of any wall or roof should not be greater than 15m, subject to the limits of paragraph 2C16;

ii. the height of the building H should not exceed twice the least width of the building W1;

iii. the height of the wing H2 should not exceed twice the least width of the wing W2 where the projection P exceeds twice the width W2;

Diagram 1 **Size and proportion of residential buildings of not more than three storeys**



b. small single-storey non-residential buildings: height H should not exceed 3m and W (being the greatest length or width of the building) should not exceed 9m (see Diagram 2), subject to the limits of paragraph 2C16;

c. annexes: height H as variously indicated in Diagram 2 should not exceed 3m, subject to the limits of paragraph 2C16.

Thickness of walls

2C5 General wall thickness may be determined according to this section provided:

a. conditions relating to the building of which the wall forms part (see paragraphs 2C4, 2C14 to 2C16, 2C38); and

b. conditions relating to the wall (see paragraphs 2C17 to 2C37) are met. (See Diagram 3.)

2C6 Solid external walls, compartment walls and separating walls in coursed brickwork or blockwork: Solid walls constructed of coursed brickwork or blockwork should be at least as thick as 1/16 of the storey height. Further requirements are given in Table 2.

2C7 Solid external walls, compartment walls and separating walls in uncoursed stone, flints, etc.: The thickness of walls constructed in uncoursed stone, flints, clunches, bricks or other burnt or vitrified material should not be less than 1.33 times the thickness determined by paragraph 2C6.

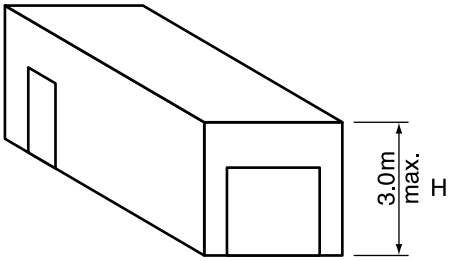
2C8 Cavity walls in coursed brickwork or blockwork: All cavity walls should have leaves at least 90mm thick and cavities at least 50mm wide. The wall ties should have a horizontal spacing of 900mm and a vertical spacing of 450mm, or alternatively should be spaced such that the number of wallties per square metre is is not less than 2.5 ties/m^2. Wall ties should also be provided, spaced not more than 300mm apart vertically, within a distance of 225mm from the vertical edges of all openings, movement joints and roof verges. For selection of wall ties for use in a range of cavity widths refer to Table 5. For specification of cavity wall ties refer to paragraph 2C19.

continued on page 23

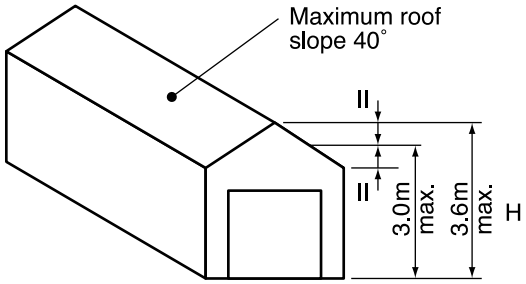
Diagram 2 **Size and proportion of non-residential buildings and annexes**

See paras 2C4b and 2C4c

a. **Non-residential buildings**

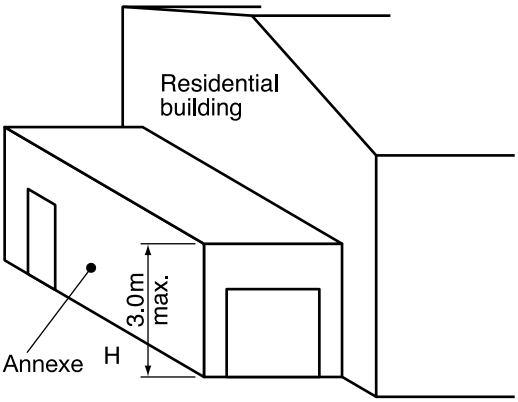


Flat roof buildings

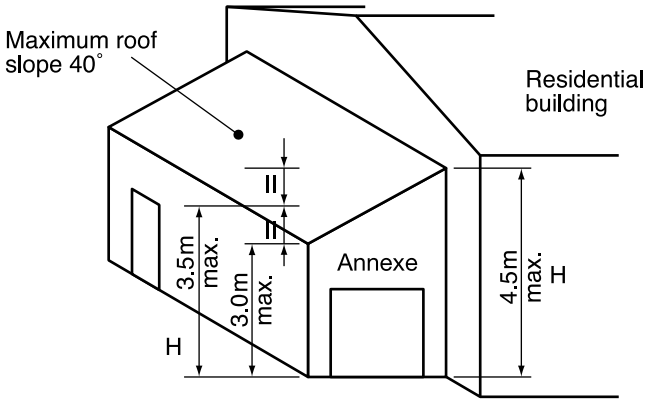


Pitched roof buildings

b. **Annexes**

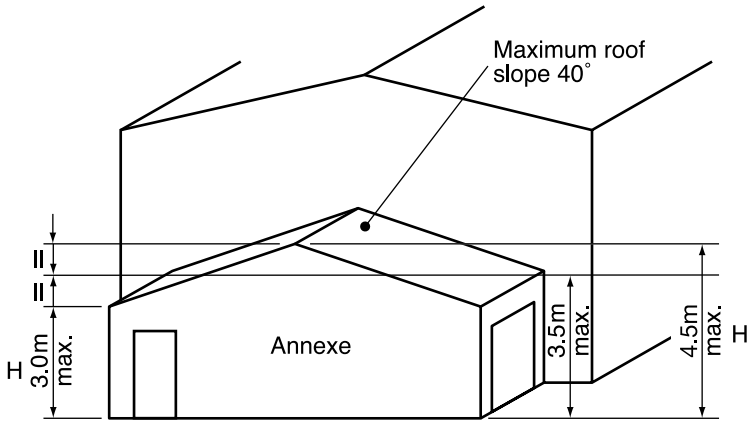


Flat roof annexes



Pitched roof annexes
(type 1)

Note
Height H should be measured from top of the foundation or from the underside of the floor slab where this provides effective lateral restraint.



Pitched roof annexes
(type 2)

Diagram 3 **Determination of wall thickness**

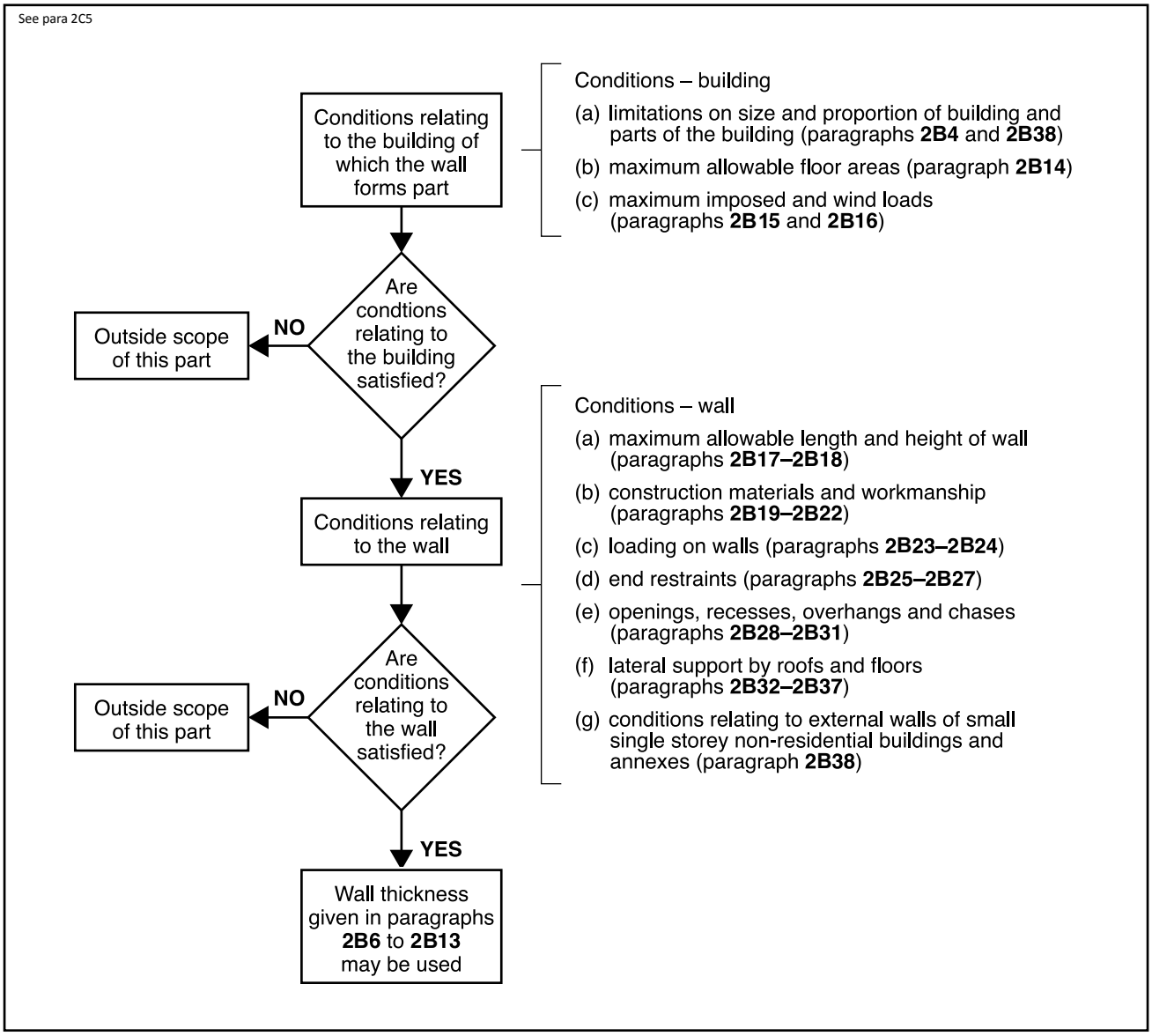
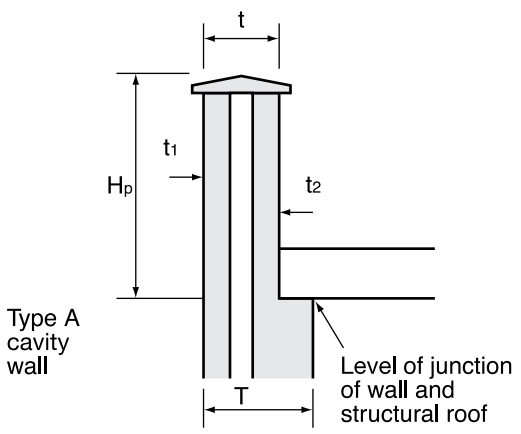


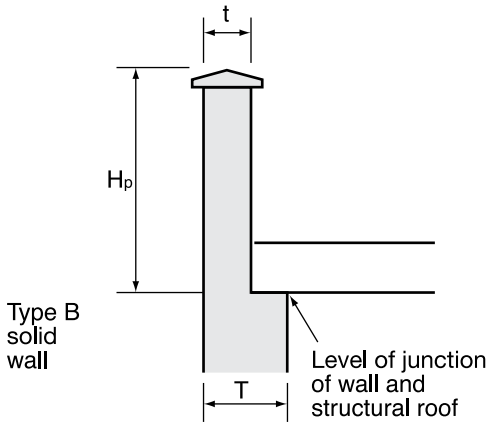
Table 2 **Minimum thickness of certain external walls, compartment walls and separating walls**

Height of wall	Length of wall	Minimum thickness of wall
Not exceeding 3.5m	Not exceeding 12m	190mm for whole of its height
Exceeding 3.5m but not exceeding 9m	Not exceeding 9m	190mm for whole of its height
	Exceeding 9m but not exceeding 12m	290mm from the base for the height of one storey and 190mm for the rest of its height
Exceeding 9m but not exceeding 12m	Not exceeding 9m	290mm from the base for the height of one storey and 190mm for the rest of its height
	Exceeding 9m but not exceeding 12m	290mm from the base for the height of two storeys and 190mm for the rest of its height

Diagram 4 **Parapet walls: height**

See para 2C11





Wall type	Thickness (mm)	Parapet height H_p to be not more than (mm)
Type A cavity wall	$t_1 + t_2$ equal or less than 200	600
	$t_1 + t_2$ greater than 200 equal or less than 250	860
Type B solid wall	t = 150	600
	t = 190	760
	t = 215	860

Note: t should be less than or equal to T

For external walls, compartment walls and separating walls in cavity construction, the combined thickness of the two leaves plus 10mm should not be less than the thickness determined by paragraph 2C6 and Table 3 for a solid wall of the same height and length.

2C9 Walls providing vertical support to other walls: Irrespective of the material used in the construction, a wall should not be less in thickness than any part of the wall to which it gives vertical support.

2C10 Internal load-bearing walls in brickwork or blockwork (except compartment walls or separating walls): All internal load-bearing walls should have a thickness not less than:

$$\frac{\text{(specified thickness from Table 2)}}{2} - 5\text{mm}$$

except for a wall in the lowest storey of a three storey building, carrying load from both upper storeys, which should have a thickness as determined by the equation or 140mm whichever is the greatest.

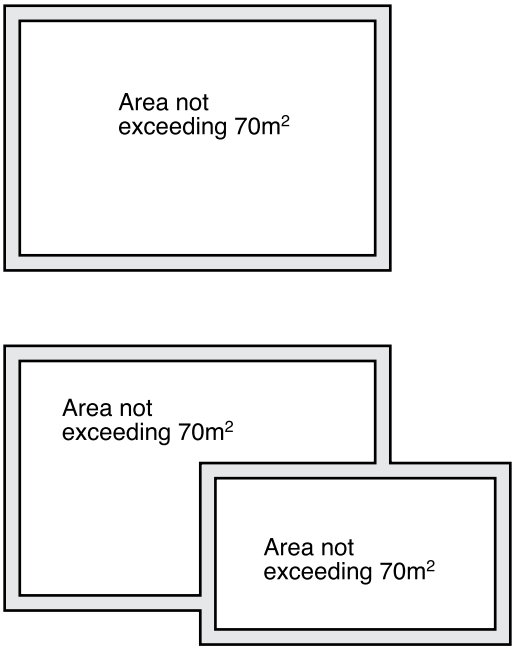
2C11 Parapet walls: The minimum thickness and maximum height of parapet walls should be as given in Diagram 4.

2C12 Single leaves of certain external walls: The single leaf of external walls of small single-storey non-residential buildings and of annexes need be only 90mm thick, notwithstanding paragraphs 2C38.

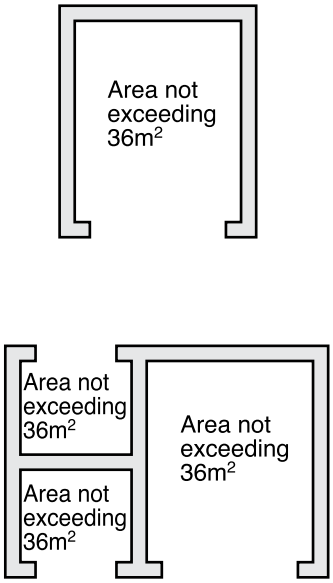
Diagram 5 **Maximum floor area enclosed by structural walls**

See para 2C14

a. **Structural walls on all sides**



b. **Structural walls on three sides**



2C13 Modular bricks and blocks: Where walls are constructed of bricks or blocks having modular dimensions, wall thicknesses prescribed in this section which derive from a dimension of brick or block may be reduced by an amount not exceeding the deviation from work size permitted by a British Standard relating to equivalent sized bricks or blocks made of the same material.

2C14 Maximum floor area: The guidance of this section assumes that no floor enclosed by structural walls on all sides exceeds 70m², and that no floor without a structural wall on one side exceeds 36m². (See Diagram 5.)

2C15 Imposed loads on roofs, floors and ceilings: The design considerations given in this section are intended to be adequate for the imposed loads given in Table 3.

2C16 Maximum height of buildings: Maximum height of buildings in un-restrained construction to be no higher than 4 stories. Specific consideration will need to be given to the effects of local wind speeds if construction over this limit is to be accepted. Further design guidance can be based on BS EN 1991-1-4:2005 with its UK National Annex.

Conditions relating to the wall

2C17 Maximum allowable length and height of the wall: This section does not deal with walls longer than 12m, measured from centre to centre of buttressing walls, piers or chimneys providing restraint, or with walls exceeding 12m in height (see also Table 2).

Table 3 **Imposed loads**

Element	Loading
Roof	Distributed loads 1.00kN/m² for spans not exceeding 12m 1.5kN/m² for spans not exceeding 6m
Floors	Distributed load: 2.00kN/m²
Ceilings	Distributed load: 0.25kN/m² together with concentrated load: 0.9kN

2B18 Rules of measurement for heights of walls and storeys: The height of a wall or a storey should be measured in accordance with the rules in Diagram 7.

Construction materials and workmanship

2C19 Wall ties: Wall ties should comply with *BS EN 845-1* and should be material references 1 or 3 in *BS EN 845* Table A 1 austenitic stainless steel. Wall ties should be selected in accordance with Table 4 of this Guernsey Technical Standard.

2C20 Masonry units: Walls should be properly bonded and solidly put together with mortar and constructed of masonry units conforming to:

a. clay bricks or blocks to *BS EN 771-1;*

b. calcium silicate bricks or blocks to *BS EN 771-2;*

c. concrete bricks or blocks to *BS EN 771-3 or BS EN 771-4;*

d. manufactured stone to *BS EN 771-5;*

e. square dressed natural stone to the appropriate requirements described in *BS EN 771-6.*

2C21 Compressive strength of masonry units: Minimum compressive strength requirements for masonry units according to BS EN Standards are given in Diagram 9, where the masonry units indicated for Conditions A, B and C should have declared compressive strengths of not less than the values given in Table 6. Normalised compressive strengths for block sized clay and calcium silicate masonry units not complying with brick dimensional format are given in Table 6.

2C22 Mortar: Mortar should be:

a. one of the following:

   i. Mortar designation (iii) according to *BS EN 1996-1-1:2005 with its UK National Annex;*

   ii. Strength class M4 according to *BS EN 998-2:2010;*

   iii. 1:1:5 or 6 CEM I, lime and fine aggregate measured by volume of dry materials, or

b. of equivalent or greater strength and durability to the specifications in a. above.

Loading on walls

2C23 Maximum span of floors: The maximum span for any floor supported by a wall is 6m where the span is measured centre to centre of bearing (see Diagram 8).

2C24 Other loading conditions:

a. Vertical loading on walls should be distributed. This may be assumed for concrete floor slabs, precast concrete floors, and timber floors designed in accordance 2B, where the bearing length for lintels is 150mm or greater. Where a lintel has a clear span of 1200mm or less the bearing length may be reduced to 100mm.

b. Differences in level of ground or other solid construction between one side of the wall and the other should be less than 4 times the thickness of the wall as shown in Diagram 9.

c. The combined dead and imposed load should not exceed 70kN/m at base of wall (see Diagram 9).

d. Walls should not be subjected to lateral load other than from wind, and that covered by paragraph 2C24(b).

End restraint

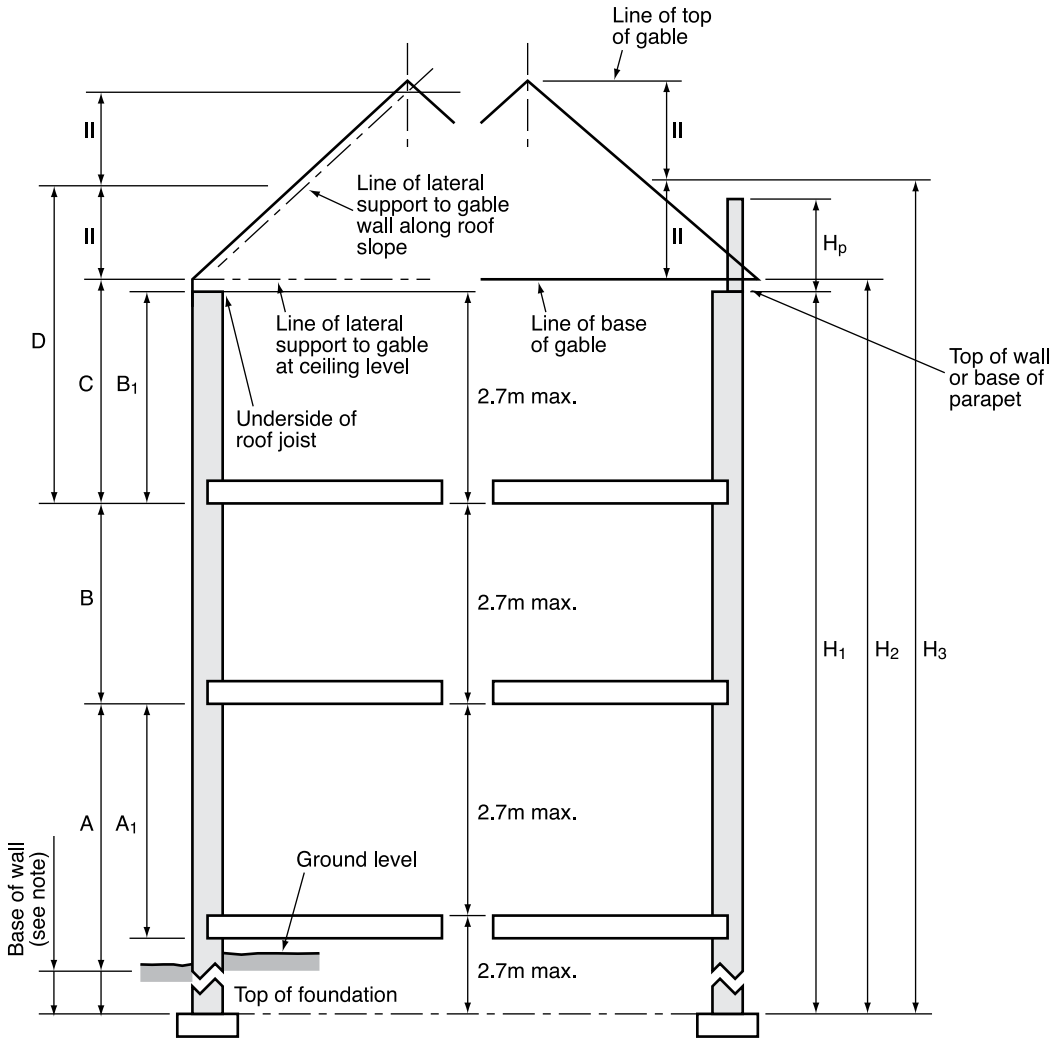
2C25 Vertical Lateral Restraint to Walls

The ends of every wall should be bonded or otherwise securely tied throughout their full height to a buttressing wall, pier or chimney. Long walls may be provided with intermediate buttressing walls, piers or chimneys dividing the wall into distinct lengths within each storey; each distinct length is a supported wall for the purposes of this section. The intermediate buttressing walls, piers or chimneys should provide lateral restraint to the full height of the supported wall, but they may be staggered at each storey.

Continued on page 29

Diagram 6 **Measuring storey and wall heights**

See para 2C18



Key

(a) **Measuring storey heights**

A_1 is the ground storey height if the ground floor provides effective lateral support to the wall, i.e. is adequately tied to the wall or is a suspended floor bearing on the wall.

A is the ground storey height if the ground floor does not provide effective lateral support to the wall.

Note: If the wall is supported adequately and permanently on both sides by suitable compact material, the base of the wall for the purposes of the storey height may be taken as the lower level of this support. (Not greater than 3.7m ground storey height.)

B is the intermediate storey height.

B_1 is the top storey height for walls which do not include a gable.

C is the top storey height where lateral support is given to the gable both at ceiling level and along the roof slope.

D is the top storey height for the external walls which include a gable where lateral support is given to the gable only along the roof slope.

(b) **Measuring wall heights**

H_1 is the height of an external wall that does not include a gable.

H_2 is the height of an internal or separating wall which is built up to the underside of the roof.

H_3 is the height of an external wall which includes a gable.

H_p is the height of a parapet (see Diagram 4). If H_p is more than 1.2m add to H_p to H_1.

Table 4 Cavity wall ties

Nominal cavity width mm (Note 1)	Permissible type of tie		
	Tie length mm (Note 2)		BS EN 845-1 tie (Note 4)
50 to 75	200	Butterfly, double triangle or vertical twist	Types 1, 2, 3 or 4 to DD 140-2* and selected on the basis of the design loading and design cavity width.
76 to 90	225	Double triangle or vertical twist	
91 to 100	225	Double triangle (Note 3) or vertical twist	
101 to 125	250	Vertical twist	
126 to 150	275	Vertical twist	
151 to 175	300	Vertical twist	
176 to 300	(See Note 2)	Vertical twist style	

Notes:

1. Where face insulated blocks are used the cavity width should be measured from the face of the masonry unit.
2. The embedment depth of the tie should not be less than 50mm in both leaves. For cavities wider than 180mm calculate the length as the structural cavity width plus 125mm and select the nearest stock length.
3. Double triangle ties of this shape having a strength to satisfy Type 2 of DD 140-2 are manufactured. Specialist tie manufacturers should be consulted if 225mm long double triangle format ties are needed for 91 to 100mm cavities.
4. Where BS EN 845-1 ties are used reference needs to be made additionally to DD 140-2 for the selection of the type (i.e. type 1, 2, 3 or 4) relevant to the performance levels given in DD 140-2.

Table 5 Declared compressive strength of masonry units complying with BS EN 771-1 to -5 (N/mm²)

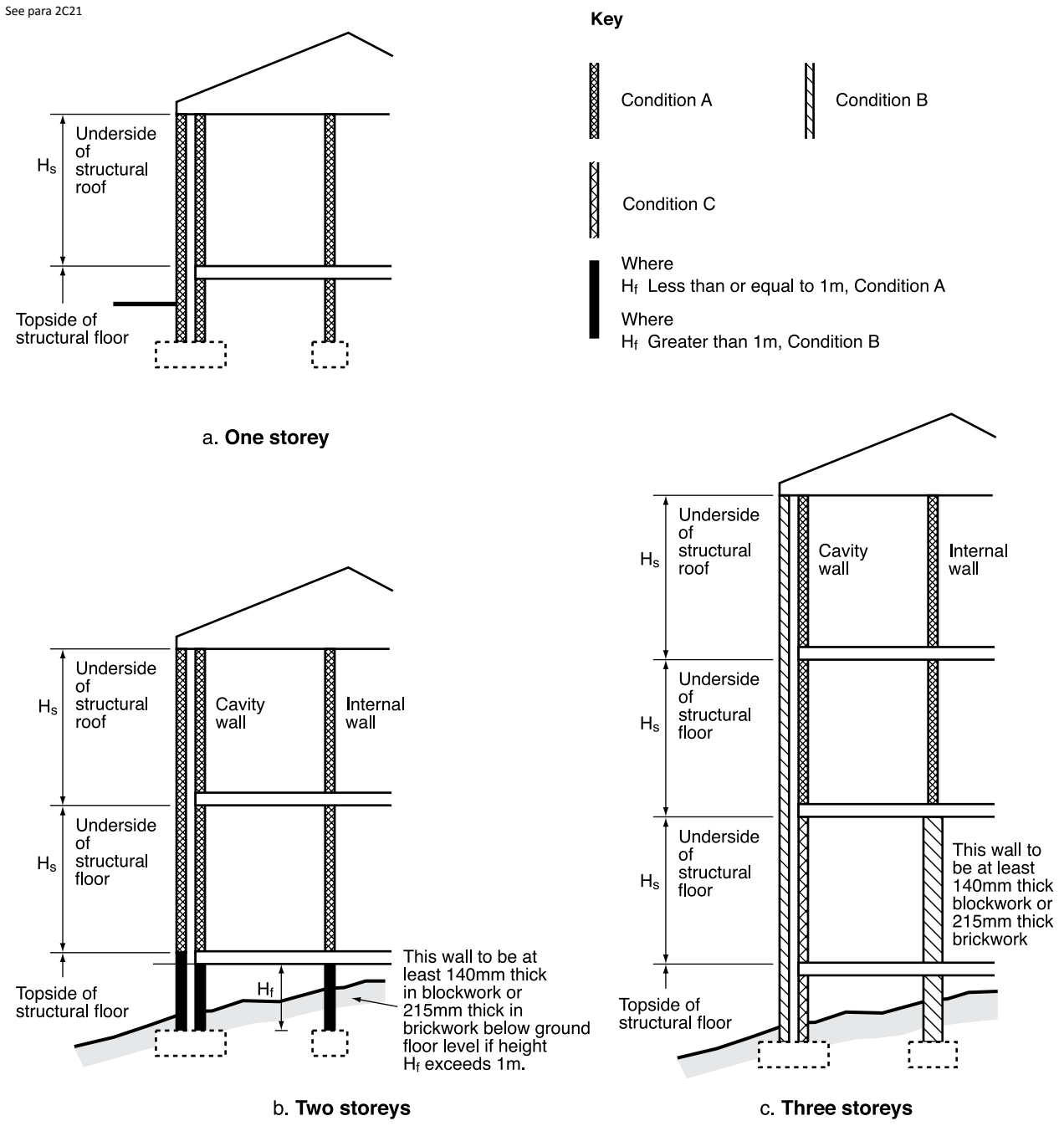
Masonry unit	Clay masonry units to BS EN 771-1		Calcium silicate masonry units to BS EN 771-2		Aggregate concrete masonry units to BS EN 771-3	Autoclaved aerated conc. masonry units to BS EN 771-4	Manufactured stone masonry units to BS EN 771-5
Condition A (See Diagram 7)							Any unit complying with BS EN 771-5 will be acceptable for conditions A, B and C
Brick	Group 1 6.0	Group 2 9.0	Group 1 6.0	Group 2 9.0	6.0	–	
Block	See Table 6	See Table 6	See Table 6	See Table 6	2.9*	2.9	
Condition B (See Diagram 7)							
Brick	Group 1 9.0	Group 2 13.0	Group 1 9.0	Group 2 13.0	9.0	–	
Block	See Table 6	See Table 6	See Table 6	See Table 6	7.3*	7.3	
Condition C (See Diagram 7)							
Brick	Group 1 18.0	Group 2 25.0	Group 1 18.0	Group 2 25.0	18.0	–	
Block	See Table 6	See Table 6	See Table 6	See Table 6	7.3*	7.3	

* These values are dry strengths to BS EN 772-1

Notes:

1. This table applies to Group 1 and Group 2 units.
2. For the EN 771 series of standards for masonry units the values of declared compressive strengths (N/mm²) given in Table 5 are mean values.
3. Brick: a masonry unit having work sizes not exceeding 337.5mm in length or 112.5mm in height.
4. Block: a masonry unit exceeding either of the limiting work sizes of a brick and with a minimum height of 190mm. For blocks with smaller heights, excluding cuts or make up units, the strength requirements are as for brick except for solid external walls where the blocks should have a compressive strength at least equal to that shown for block for an inner leaf of a cavity wall in the same position.
5. Group 1 masonry units have not more than 25% formed voids (20% for frogged bricks). Group 2 masonry units have formed voids greater than 25%, but not more than 55%.

Diagram 7 **Declared compressive strength of masonry units**



Notes

1 If H_s is not greater than 2.7m, the compressive strength of bricks or blocks should be used in walls as indicated by the key.

2 If H_s is greater than 2.7m, the compressive strength of bricks or blocks used in the wall should be at least Condition B, or as indicated by the key, whichever is the greater.

3 If the external wall is solid construction, the masonry units should have a compressive strength of at least that shown for the internal leaf of a cavity wall in the same position.

4 The guidance given in the diagram for walls of two and three storey buildings should only be used to determine the compressive strength of the masonry units where the roof construction is of timber.

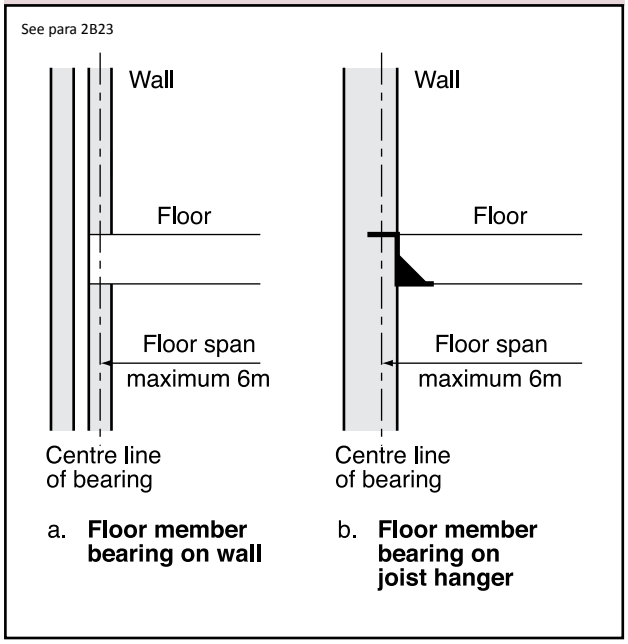
Table 6 **Normalised compressive strength of masonry units of clay and calcium silicate blocks complying with BS EN 771-1 and 2 (N/mm²)**

Standard	Condition (See Diagram 9)	Group 1 masonry units	Group 2 masonry units
Clay masonry units to BS EN 771-1 Calcium silicate masonry units to BS EN 771-2	A	5.0	8.0
	B	7.5	11.0
	C	15.0	21.0

Notes:

1. Values in this table are normalised compressive strengths (N/mm²). Compressive strengths of masonry units should be derived according to EN 772-1.
2. The table applies to clay and calcium silicate block masonry units where the work size exceeds 337.5mm in length or 112.5mm in height.
3. Group 1 masonry units have not more than 25% formed voids (20% for frogged bricks). Group 2 masonry units have formed voids greater than 25%, but not more than 55%.

Diagram 8 **Maximum span of floors**



2C26 Buttressing Walls:

If the buttressing wall is not itself a supported wall its thickness T2 should not be less than:

a. half the thickness required by this section for an external or separating wall of similar height and length less 5mm; or

b. 75mm if the wall forms part of a dwelling house and does not exceed 6m in total height and 10m in length; and

c. 90mm in other cases.

The length of the buttressing wall should be at least 1/6 of the overall height of the supported wall and be bonded or securely tied to the supporting wall and at the other end to a buttressing wall, pier or chimney.

The size of any opening in the buttressing wall should be restricted as shown in Diagram 10

2C27 Design criteria for piers and chimneys providing restraint:

a. piers should measure at least 3 times the thickness of the supported wall and chimneys twice the thickness, measured at right angles to the wall. Piers should have a minimum width of 190mm (see Diagram 11);

b. the sectional area on plan of chimneys (excluding openings for fireplaces and flues) should be not less than the area required for a pier in the same wall, and the overall thickness should not be less than twice the required thickness of the supported wall (see Diagram 11).

Openings, recesses, overhangs and chases

2C28 General:

The number, size and position of openings and recesses should not impair the stability of a wall or the lateral restraint afforded by a buttressing wall to a supported wall. Construction over openings and recesses should be adequately supported.

2C29 Dimensional criteria for openings and recesses:

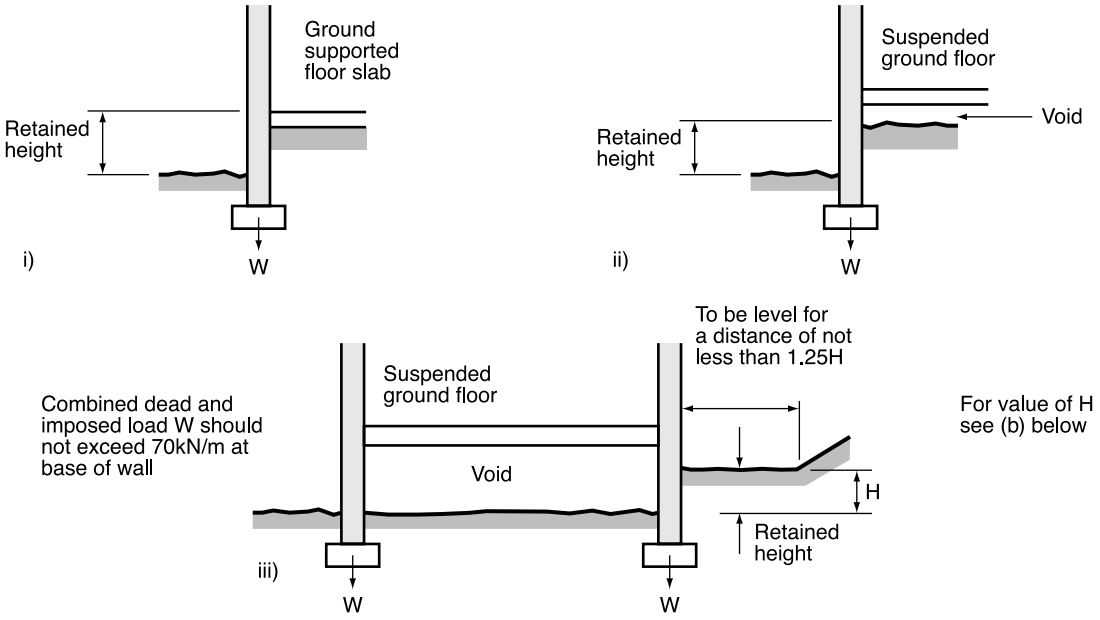
The dimensional criteria are given in Diagram 12 and Table 7.

No openings should be provided in walls below ground floor except for small holes for services and ventilation, etc. which should be limited to a maximum area of 0.1m² at not less than 2m centres.

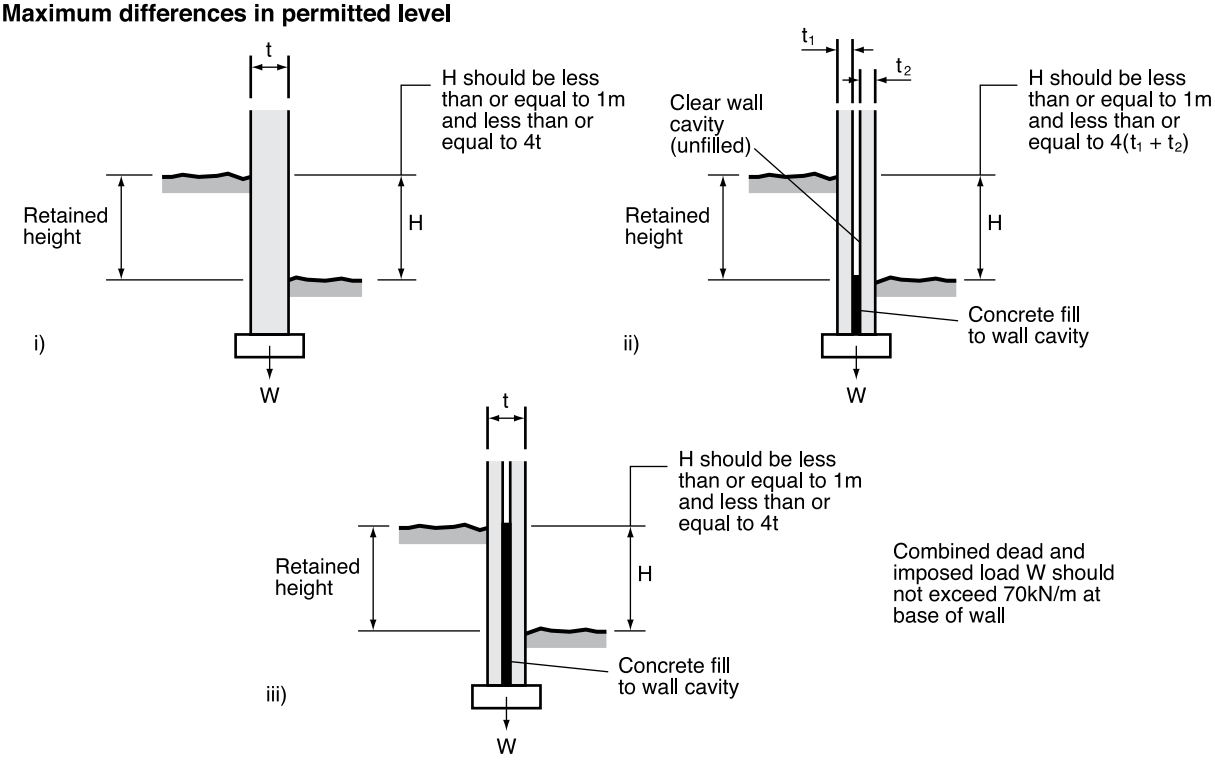
Diagram 9 **Differences in ground levels**

See para 2C24b

a. **Situations where differences in level may occur**



b. **Maximum differences in permitted level**



Notes

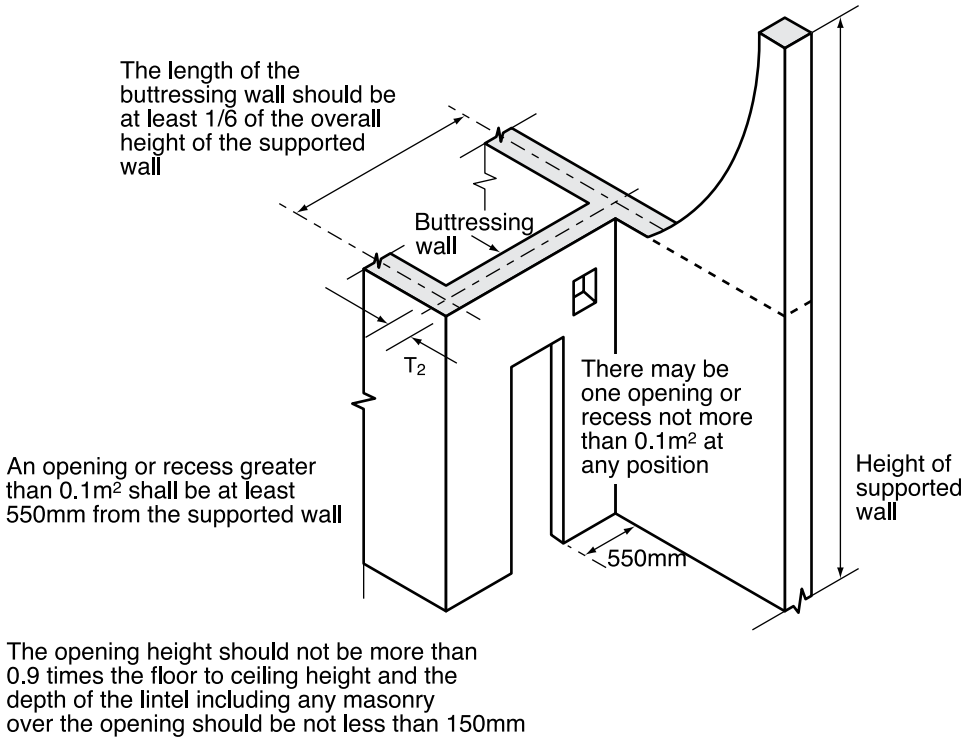
1 Floor slabs in figure b have been omitted for clarity and may be on either side of the walls shown.

2 Cavity walls should be tied in accordance with Table 5.

3 These recommendations apply only to circumstances where there is a full storey height of masonry above the upper retained level.

Diagram 10 **Openings in a buttressing wall**

See para 2C26



Notes

1 The buttressing wall should be bonded or securely tied to the supported wall and at the other end to a buttressing wall, pier or chimney.

2 Openings or recesses in the buttressing wall should be as shown – the position and shape of the openings should not impair the lateral support to be given by the buttressing wall.

3 Refer to Diagram 8 for the rules for measuring the height of the supported wall.

2C30 Chases:

a. vertical chases should not be deeper than 1/3 of the wall thickness or, in cavity walls, 1/3 of the thickness of the leaf;

b. horizontal chases should not be deeper than 1/6 of the thickness of the leaf of the wall;

c. chases should not be so positioned as to impair the stability of the wall, particularly where hollow blocks are used.

2C31 Overhangs:

The amount of any projection should not impair the stability of the wall.

Lateral support by roofs and floors

2C32 A wall in each storey of a building should extend to the full height of that storey, and have horizontal lateral supports to restrict movement of the wall at right angles to its plane.

2C33 Floors and roofs should:

a. act to transfer lateral forces from walls to buttressing walls, piers or chimneys; and

b. be secured to the supported wall by connections specified in paragraphs 2C34 and 2C35.

2C34 The requirements for lateral restraint of walls at roof and floor levels are given in Table 8 and guidance on satisfying the requirements is given in paragraphs 2C35 and 2C36.

Diagram 11 **Buttressing**

See para 2C27

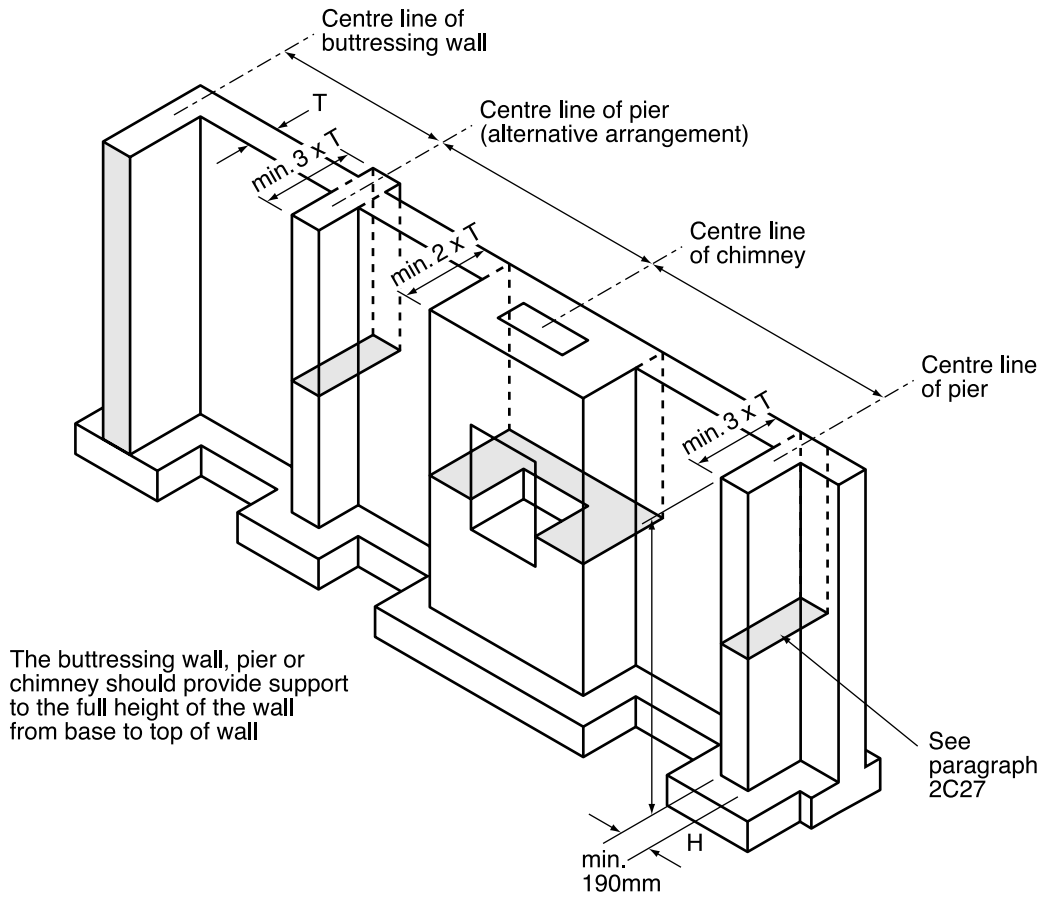


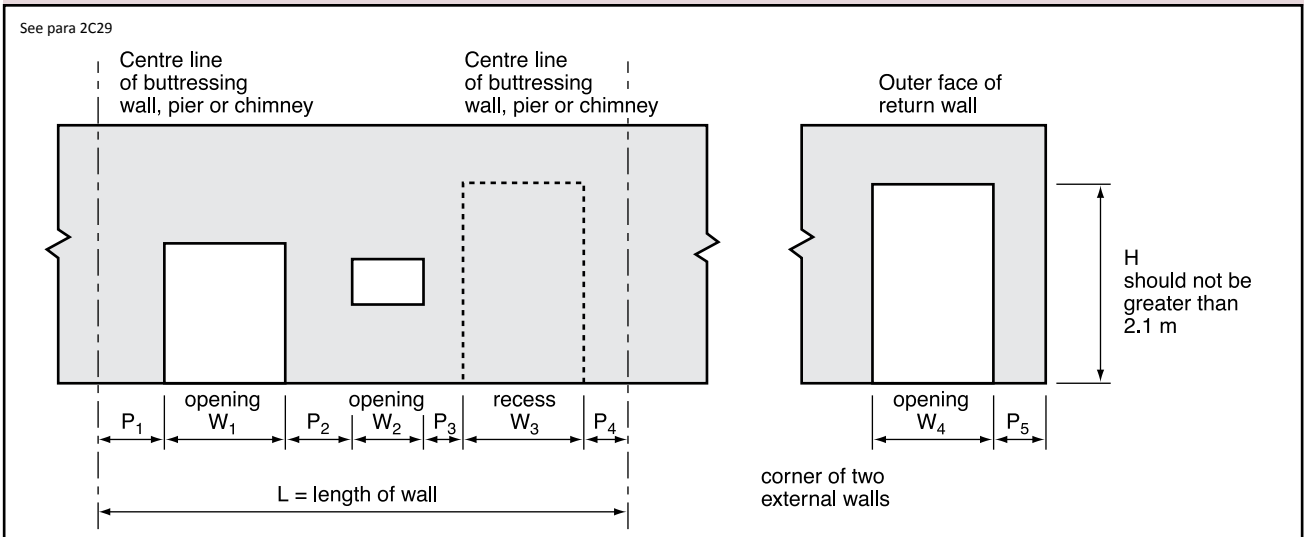
Table 7 **Value of Factor 'X' (see Diagram 12)**

Nature of roof span	Maximum roof span (m)	Minimum thickness of wall inner (mm)	Span of floor is parallel to wall	Span of timber floor into wall		Span of concrete floor into wall	
				max 4.5m	max 6.0m	max 4.5m	max 6.0m
			Value of factor 'X'				
Roof spans parallel to wall	Not applicable	100	6	6	6	6	6
		90	6	6	6	6	5
Timber roof spans into wall	9	100	6	6	5	4	3
		90	6	4	4	3	3

Table 8 **Lateral support for walls**

Wall type	Wall length	Lateral support required
Solid or cavity: external compartment separating	Any length	Roof lateral support by every roof forming a junction with the supported wall
	Greater than 3m	Floor lateral support by every floor forming a junction with the supported wall
Internal load-bearing wall (not being a compartment or separating wall)	Any length	Roof or floor lateral support at the top of each storey

Diagram 12 **Sizes of openings and recesses**



Notes

Requirements (refer to Table 6 for values of Factor X).

1 $W_1 + W_2 + W_3$ should not exceed $\frac{2L}{3}$

2 W_1, W_2 or W_3 should not exceed 3m

3 P_1 should be greater than or equal to $\frac{W_1}{X}$

4 P_2 should be greater than or equal to $\frac{W_1 + W_2}{X}$

5 P_3 should be greater than or equal to $\frac{W_2 + W_3}{X}$

6 P_4 should be greater than or equal to $\frac{W_3}{X}$

7 P_5 should be greater than or equal to $\frac{W_4}{X}$ but should not be less than 665mm.

8 Take the value of the Factor X from Table **5**, or it can be given the value 6, provided the compressive strength of the bricks or blocks (in the case of a cavity wall – in the loaded leaf) is not less than 7N/mm².

2C35 Walls should be strapped to floors above ground level, at intervals not exceeding 2m and as shown in Diagram 13 by tension straps conforming to *BS EN 845-1*. For corrosion resistance purposes, the tension straps should be material reference 14 or 16.1 or 16.2 (galvanised steel) or other more resistant specifications including material references 1 or 3 (austenitic stainless steel). The declared tensile strength of tension straps should not be less than 8kN.

Tension straps need not be provided:

a. in the longitudinal direction of joists in houses of not more than 2 storeys, if the joists are at not more than 1.2m centres and have at least 90mm bearing on the supported walls or 75mm bearing on a timber wall-plate at each end, and

b. in the longitudinal direction of joists in houses of not more than 2 storeys, if the joists are carried on the supported wall by joist hangers in accordance with *BS EN 845-1* of the restraint type described by additional guidance given in BSI Published Document PD 6697:2010 and shown in Diagram 13(c), and are incorporated at not more than 2m centres, and

c. when a concrete floor has at least 90mm bearing on the supported wall (see Diagram 13(d)), and

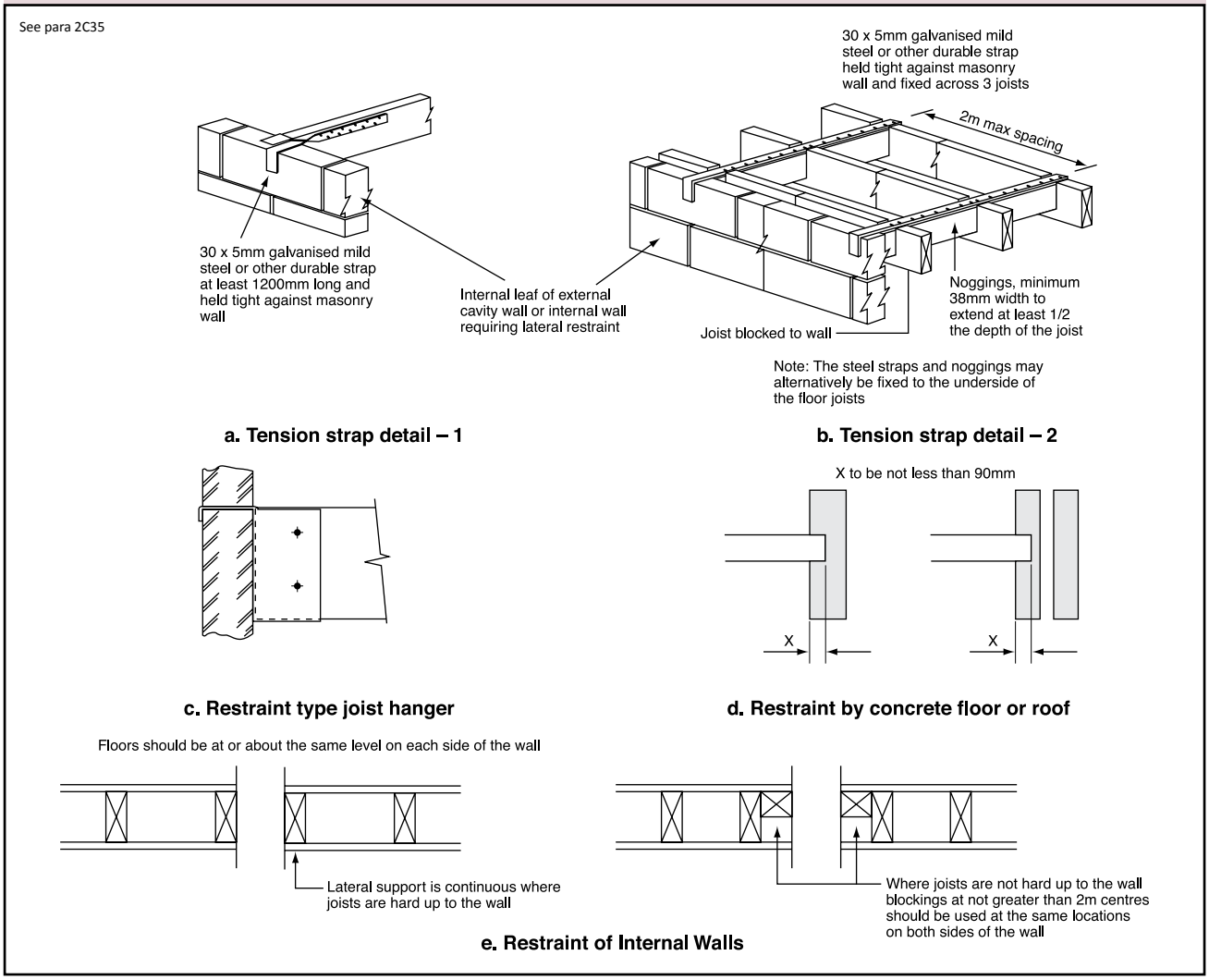
d. where floors are at or about the same level on each side of a supported wall, and contact between the floors and wall is either continuous or at intervals not exceeding 2m. Where contact is intermittent, the points of contact should be in line or nearly in line on plan (see Diagram 13(e)).

2C36 Gable walls should be strapped to roofs as shown in Diagram 14(a) and (b) by tension straps as described in 2C35.

Vertical strapping at least 1m in length should be provided at eaves level at intervals not exceeding 2m as shown in Diagram 14(c) and (d). Vertical strapping may be omitted if the roof:

a. has a pitch of 15° or more, and

Diagram 13 **Lateral support by floors**



b. is tiled or slated, and

c. is of a type known by local experience to be resistant to wind gusts, and

d. has main timber members spanning onto the supported wall at not more than 1.2m centres.

Interruption of lateral support

2C37 Where an opening in a floor or roof for a stairway or the like adjoins a supported wall and interrupts the continuity of lateral support, the following conditions should be satisfied for the purposes of Section 2C:

a. the maximum permitted length of the opening is to be 3m, measured parallel to the supported wall, and

b. where a connection is provided by means other than by anchor, this should be provided throughout the length of each portion of the wall situated on each side of the opening, and

c. where a connection is provided by mild steel anchors, these should be spaced closer than 2m on each side of the opening to provide the same number of anchors as if there were no opening, and

d. there should be no other interruption of lateral support.

Small single-storey non-residential buildings and annexes

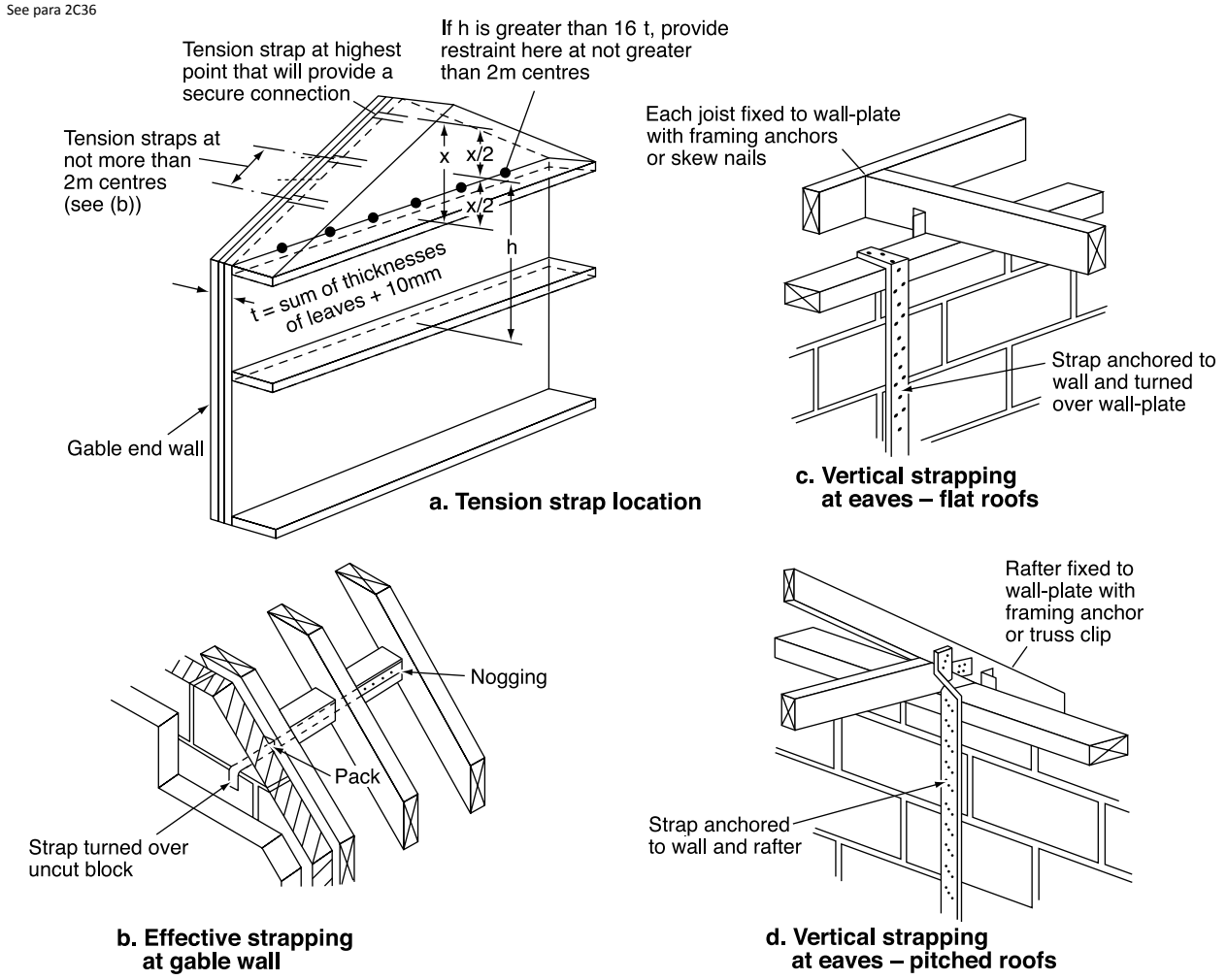
2C38 Size and proportion

(i.) General

The guidance given applies in the following circumstances:

a. The floor area of the building or annexe does not exceed 36m².

Diagram 14 **Lateral support at roof level**



b. The walls are solidly constructed in brickwork or blockwork using materials which comply with paragraphs 2C19 to 2C22.

c. Where the floor area of the building or annexe exceeds 10m² the walls have a mass of not less than 130kg/m².

Note: There is no surface mass limitation recommended for floor areas of 10m² or less.

d. Access to the roof is only for the purposes of maintenance and repair.

e. The only lateral loads are wind loads.

f. The maximum length or width of the building or annexe does not exceed 9m.

g. The height of the building or annexe does not exceed the lower value derived from Diagram 2.

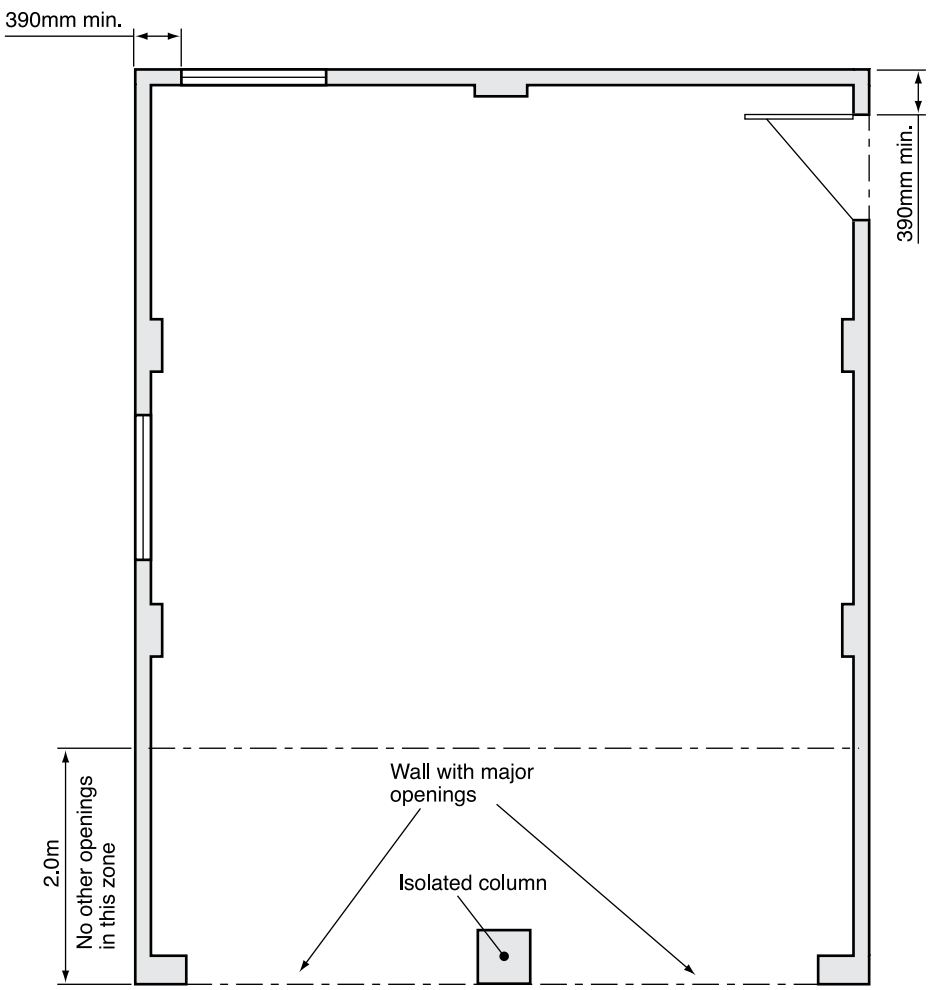
h. The roof is braced at rafter level, horizontally at eaves level and at the base of any gable by roof decking, rigid sarking or diagonal timber bracing, as appropriate, in accordance with *BS EN 1995-1-1:2004 with its UK National Annex* and additional guidance given in *BSI Published Document PD 6693-1:2012 or BS 8103-3:2009.*

i. Walls are tied to the roof structure vertically and horizontally in accordance with paragraphs 2C32 to 2C36 and with horizontal lateral restraint at roof level in accordance with paragraph (iv) below.

j. The roof structure of an annexe is secured to the structure of the main building at both rafter and eaves level.

Diagram 15 **Size and location of openings**

See para 2C38



Notes

1 Major openings should be restricted to one wall only. Their aggregate width should not exceed 5.0m and their height should not be greater than 2.1m.

2 There should be no other openings within 2.0m of a wall containing a major opening.

3 The aggregate size of openings in a wall not containing a major opening should not exceed 2.4m^2.

4 There should not be more than one opening between piers.

5 Unless there is a corner pier the distance from a window or a door to a corner should not be less than 390mm.

(ii) Size and location of openings

One or two major openings not more than 2.1m in height are permitted in one wall of the building or annexe only. The width of a single opening or the combined width of two openings should not exceed 5m.

The only other openings permitted in a building or annexe are for windows and a single leaf door. The size and location of these openings should be in accordance with Diagram 15.

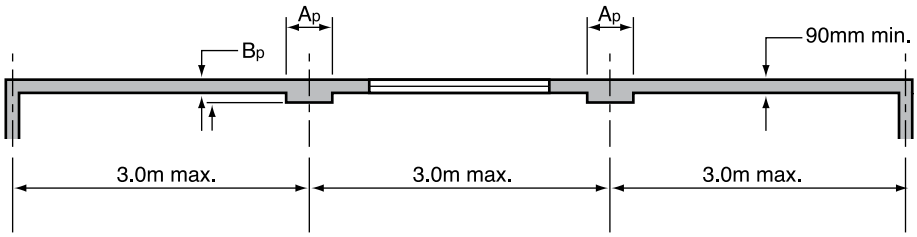
(iii) Wall thickness and recommendations for piers

The walls should have a minimum thickness of 90mm.

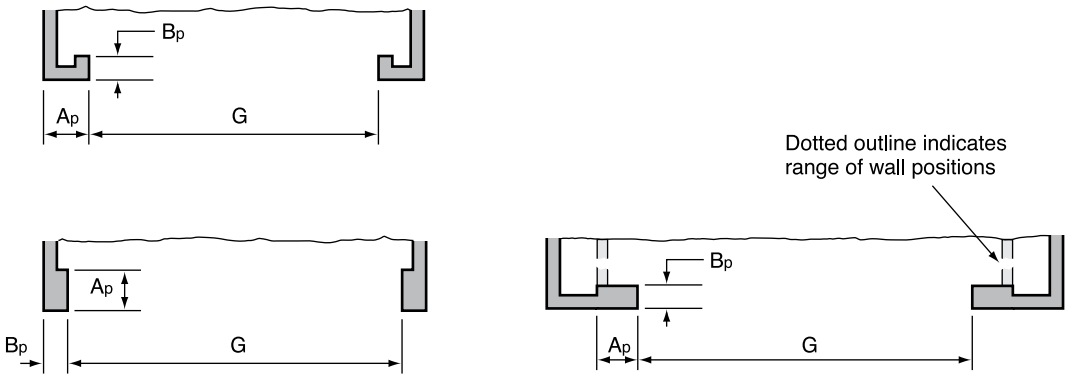
Diagram 16 **Wall thickness**

See para 2C38

a. Wall without a major opening



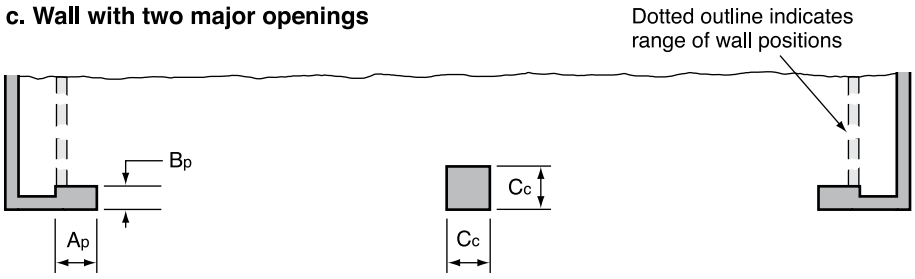
b. Wall with a single major opening



Orientation of piers with opening width G not greater than 2.5m

Orientation of piers with opening width G greater than 2.5m

c. Wall with two major openings



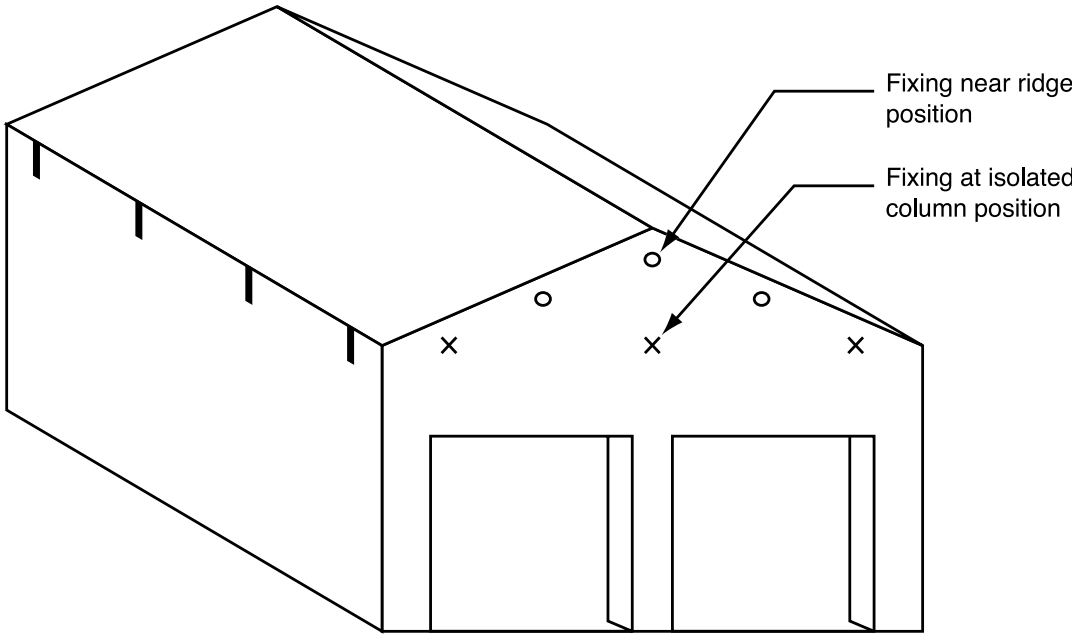
Notes

1 In all cases the minimum pier size (A_p x B_p) should be 390mm x 190mm or 327mm x 215mm depending on the size of the masonry units.

2 Isolated column (Case c) to be 325mm x 325mm minimum (C_c x C_c).

Diagram 17 **Lateral restraint at roof level**

See para 2C38



Key

| denotes fixings at eaves level.

× denotes fixings at base of gable.

o denotes fixings along roof slope.

Note: Fixings should be in accordance with Diagram **15**.

Walls which do not contain a major opening but exceed 2.5m in length or height should be bonded or tied to piers for their full height at not more than 3m centres as shown in Diagram 16a. Walls which contain one or two major openings should in addition have piers as shown in Diagrams 16b and 16c. Where ties are used to connect piers to walls they should be flat, 20mm x 3mm in cross section, be in stainless steel in accordance with clause 2C19, be placed in pairs and be spaced at not more than 300mm centre vertically.

(iv) Horizontal lateral restraint at roof level

Walls should be tied horizontally at no more than 2m centres to the roof structure at eaves level, base of gables and along roof slopes as shown in Diagram 17 with straps fixed in accordance with paragraphs 2C35 and 2C36. Where straps cannot pass through a wall they should be adequately secured to the masonry using suitable fixings. Isolated columns should also be tied to the roof structure (see Diagram 17).

Section 2D: Proportions for masonry chimneys above the roof surface

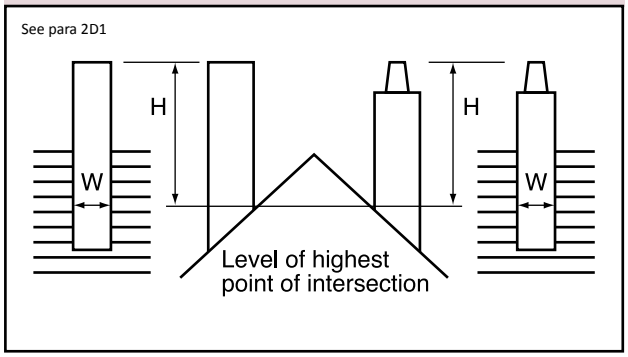
Height to width relationship

2D1 Where a chimney is not adequately supported by ties or securely restrained in any way, its height if measured from the highest point of intersection with the roof surface, gutter, etc. should not exceed 4.5W, provided the density of the masonry is greater than 1500kg/m^3, where:

W is the least horizontal dimension of the chimney measured at the same point of intersection, and

H is measured to the top of any chimney pot or other flue terminal (see Diagram 18).

Diagram 18 **Proportions for masonry chimneys**



Section 2E: Foundations of plain concrete

Conditions relating to the ground

2E1 There should not be:

a. non-engineered fill (as described in *BRE Digest 427*) or wide variation in ground conditions within the loaded area; nor

b. weaker or more compressible ground at such a depth below the foundation as could impair the stability of the structure.

Design provisions

2E2 The following design provisions relate to foundations:

a. the foundations should be situated centrally under the wall;

b. for foundations in chemically aggressive soil conditions guidance in *BS 8500-1 and BRE Special Digest 1* should be followed. In non-aggressive soils, concrete should be composed of Portland cement to *BS EN 197-1 and -2* and fine and coarse aggregate conforming to *BS EN 12620* and the mix should comply with one of the following recommendations:

   i. in proportion of 50kg of Portland cement to not more than 200kg (0.1m^3) of fine aggregate and 400kg (0.2m^3) of coarse aggregate; or

   ii. grade ST2 or grade GEN I concrete to *BS 8500-2;*

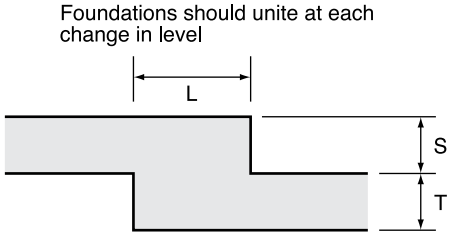
c. minimum thickness T of concrete foundation should be 150mm or P, whichever is the greater where P is derived using Table 9 and Diagram 21. Trench fill foundations may be used as an acceptable alternative to strip foundations;

d. foundations stepped on elevation should overlap by twice the height of the step, by the thickness of the foundation, or 300mm, whichever is greater (see Diagram 19).

   For trench fill foundations the overlap should be twice the height of the step or 1m, whichever is greater;

e. steps in foundations should not be of greater height than the thickness of the foundation (see Diagram 19);

Diagram 19 **Elevation of stepped foundation**



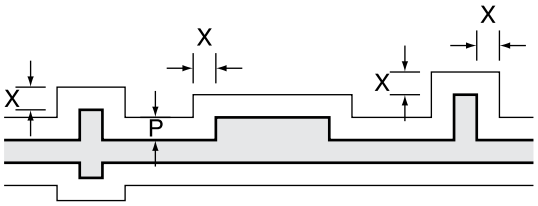
Minimum overlap L = twice height of step, or thickness of foundation or 300mm, whichever is greater

S should not be greater than T

(For trench fill foundations, minimum overlap L = twice height of step, or 1m, whichever is greater)

Diagram 20 **Piers and chimneys**

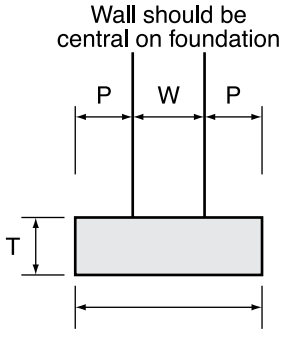
See para 2E2f



Projection X should not be less than P

Diagram 21 **Foundation dimensions**

See para 2E2c



The minimum thickness of the foundation (T) should either be P or 150mm, whichever is greater

Foundation width should be not less than the appropriate dimension in Table 10

Trench fill foundations may be used as an alternative to strip foundations.

Table 9 **Minimum width of strip footings**

Type of ground (including engineered fill)	Condition of ground	Field test applicable	Total load of load-bearing walling not more than (kN/linear metre)					
			20	30	40	50	60	70
			Minimum width of strip foundations (mm)					
I Rock	Not inferior to sandstone, limestone or firm chalk	Requires at least a pneumatic or other mechanically operated pick for excavation	In each case equal to the width of wall					
II Gravel or sand	Medium dense	Requires pick for excavation. Wooden peg 50mm square in cross section hard to drive beyond 150mm	250	300	400	500	600	650
III Clay Sandy clay	 Stiff Stiff	Can be indented slightly by thumb	250	300	400	500	600	650
IV Clay Sandy clay	 Firm Firm	Thumb makes impression easily	300	350	450	600	750	850
V Sand Silty sand Clayey sand	 Loose Loose Loose	Can be excavated with a spade. Wooden peg 50mm square in cross section can be easily driven	400	600	Note: Foundations on soil types V and VI do not fall within the provisions of this section if the total load exceeds 30kN/m.			
VI Silt Clay Sandy clay Clay or silt	 Soft Soft Soft Soft	Finger pushed in up to 10mm	450	650				
VII Silt Clay Sandy clay Clay or silt	 Very soft Very soft Very soft Very soft	Finger easily pushed in up to 25mm	Refer to specialist advice					

The table is applicable only within the strict terms of the criteria described within it.

f. foundations for piers, buttresses and chimneys should project as indicated in Diagram 20 and the projection X should never be less than the value of P where there is no local thickening of the wall.

Minimum width of strip foundations

2E3 The recommended minimum widths of foundations given in Table 9 may be used.

Minimum depth of strip foundations

2E4 Except where strip foundations are founded on rock, the strip foundations should have a minimum depth of 0.45m to their underside to avoid the action of frost. This depth, however, will commonly need to be increased in areas subject to long periods of frost or in order to transfer the loading onto satisfactory ground.

In clay soils subject to volume change on drying ('shrinkable clays', with Plasticity Index greater than or equal to 10%), strip foundations should be taken to a depth where anticipated ground movements will not impair the stability of any part of the building taking due consideration of the influence of vegetation and trees on the ground. The depth to the underside of foundations on clay soils should not be less than 0.75m on low shrinkage clay soils, 0.9m on medium shrinkage clay soils and 1.0m on high shrinkage clay soils, although these depths may need to be increased in order to transfer the loading onto satisfactory ground, or where there are trees nearby.

Section 3: Wall cladding

General

3.1 Wall cladding presents a hazard if it becomes detached from the building. This section provides guidance on the support and fixing of wall cladding. An acceptable level of safety can be achieved by different means depending on the type and location of the cladding. The guidance given relates to all forms of cladding, including curtain walling and glass facades. It is not intended to provide guidance concerning the weather resistance of wall cladding which is included in Guernsey Technical Standard C, Site preparation and resistance to contaminants and moisture, or guidance on resistance to spread of fire which is included in Guernsey Technical Standard B, Fire Safety, or guidance in relation to sound insulation, which is included in Guernsey Technical Standard E, Resistance to the passage of sound.

Technical approach

3.2 The cladding will meet the safety requirement if:

a. the cladding is capable of safely sustaining and transmitting to the supporting structure of the building all dead, imposed and wind loads, and

b. the cladding is securely fixed to and supported by the structure of the building. This shall comprise both vertical support and horizontal restraint, and

c. provision is made, where necessary, to accommodate differential movement of the cladding and the supporting structure of the building, and

d. the cladding and its fixings (including any support components) are of durable materials; the design life of the fixings being not less than that of the cladding. Fixings shall be corrosion resistant and of a material type appropriate for the local environment.

Loading

3.3 Wind loading on the cladding should be derived from *BS EN 1991-1-4:2005 with its UK National Annex* with due consideration given to local increases in wind suction arising from funnelling of the wind through gaps between buildings.

3.4 Where the cladding is required to support other fixtures, e.g. handrails, and fittings, e.g. antennae and signboards, account should be taken of the loads and forces arising from such fixtures and fittings.

3.5 Where the wall cladding is required to function as pedestrian guarding to stairs, ramps, vertical drops of more than 600mm in dwellings or more than the height of two risers (or 380mm if not part of a stair) in other buildings, or as a vehicle barrier, then account should be taken of the additional imposed loading, as stipulated in Guernsey Technical Standard K, Safe means of access and egress.

3.6 Where the wall cladding is required to safely withstand lateral pressures from crowds, an appropriate design loading is given in *BS EN 1991-1-1:2002 with its UK National Annex and the Guide to Safety at Sports Grounds (4th Edition, 1997)*.

Fixings

3.7 The selection of fixings for supporting cladding should be determined from a consideration of the proven performance of the fixing and the risks associated with the particular application. In this regard applications should be designated as being either non-redundant (where the failure of a single fixing could lead to the detachment of the cladding) or redundant (where failure or excessive movement of one fixing results in load sharing by adjacent fixings) and the required reliability of the fixing determined accordingly.

Note: Attention is drawn to the availability of anchors with an European Technical Approval (ETA) gained in accordance with the requirements of *ETAG 001 Guideline for European Technical Approval Metal Anchors for use in Concrete Parts 1-5,* which covers both redundant and non-redundant applications, and Part 6 which covers 'Anchors for multiple use in non-structural applications' and which can effectively be regarded as covering redundant use. The UK definition of 'multiple use' which is also used in Guernsey is contained in an annexe to the ETAG Part 6 and is framed in such a way that all applications can be validated as to whether or not they conform to this category without calculation. All ETAG parts may be downloaded in English from www.eota.be.

3.8 The strength of fixings should be derived from tests using materials representative of the material into which the fixing is to be anchored, taking account of any inherent weaknesses that may affect the strength of the fixing, e.g. cracks in concrete due to shrinkage and flexure, or voids in masonry construction. The design loads will generally be available from the manufacturer's test data determined from an ETA or an extant British Standard.

Note: ETAs are available which cover use either in both cracked and non-cracked concrete or in non-cracked concrete only. Those which cover both cracked and non-cracked concrete allow higher loads for use in non-cracked than in cracked concrete.

Further guidance

3.9 The use of large panels of glass in cladding of walls and roofs where the cladding is not divided into small areas by load-bearing framing requires special consideration. Guidance is given in the following documents:

The Institution of Structural Engineers' Report on 'Structural use of glass in buildings' dated 1999, available from 11 Upper Belgrave Street, London SW1X 8BH.

'Nickel sulfide in toughened glass' published by the Centre for Window Cladding and Technology dated 2000.

3.10 Further guidance on cladding is given in the following documents:

The Institution of Structural Engineers' Report on 'Aspects of Cladding' dated 1995.

The Institution of Structural Engineers' Report on 'Guide to the structural use of adhesives' dated 1999.

BS 8297:2000 Code of practice for the design and installation of non-load-bearing pre-cast concrete cladding.

BS 8298:2010 Code of practice for the design and installation of natural stone cladding and lining.

3.11 Additional guidance on fixings is given in the following documents:

ETAG No. 001 1997 Guideline for European Technical Approvals of Metal Anchors for use in Concrete, European Organisation for Technical Approvals (EOTA), Brussels. All EOTA parts may be downloaded in English from www.eota.be.

English version published by the British Board of Agreement, PO Box 195, Bucknalls Lane, Garston, Watford, Hertfordshire WD25 9BA.

Part 1 Anchors in general.

Part 2 Torque controlled anchors.

Part 3 Undercut anchors.

Part 4 Deformation controlled anchors.

Part 5 Bonded anchors.

Part 6 Metal anchors for redundant use in concrete for lightweight systems.

BS 5080-1:1993 Structural fixings in concrete and masonry. Method of test for tensile loading.

CIRIA Report RP 566 Cladding Fixings: Good practice guidance.

CIRIA Reports C579 and C589 Retention of masonry facades – Best practice guide.Guidance notes published by the Construction Fixings Association www.fixingscfa.co.uk

Guidance Note: Procedure for Site Testing Construction Fixings (1994).

Guidance Note: European Technical Approvals for Construction Fixings (1998).

Guidance Note: Anchor Selection (1995).

Guidance Note: Fixings and Fire (1998).

Guidance Note: Anchor Installation (1996).

Guidance Note: Bonded Anchors (1999).

Guidance Note: Heavy Duty Expansion Anchors (1997).

Guidance Note: Fixings for Brickwork and Blockwork (1997).

Guidance Note: Undercut Anchors (1998).

Guidance Note: Fixings and Corrosion (2002).

Section 4: Roof covering

Materials

4.1 All materials used to cover roofs, excluding windows of glass in residential buildings with roof pitches of not less than 15°, shall be capable of safely withstanding the concentrated imposed loads upon roofs specified in *BS EN 1991-1-1:2002 with its UK National Annex.* Transparent or translucent covering materials for roofs not accessible except for normal maintenance and repair are excluded from the requirement to carry the concentrated imposed loads upon roofs if they are non-fragile or otherwise suitably protected against collapse.

Re-covering of roofs

4.2 The re-covering of roofs is commonly undertaken to extend the useful life of buildings. Roof structures may be required to carry underdrawing or insulation provided at a time later than their initial construction. This section provides guidance on determining whether such work to a roof constitutes a material alteration under the Building Regulations.

4.3 Where the work involves a significant change in the applied loading the structural integrity of the roof structure and the supporting structure should be checked to ensure that upon completion of the work the building is not less compliant with requirement A1 than the original building.

4.4 A significant change in roof loading is when the loading upon the roof is increased by more than 15%. Consideration may also be given to whether the roof covering being replaced is the original as-built covering.

4.5 Where such checking of the existing roof structure indicates that the construction is unable to sustain any proposed increase in loading (e.g. due to overstressed members or unacceptable deflection leading to ponding), appropriate strengthening work or replacement of roofing members should be undertaken. This is classified as a material alteration.

4.6 In carrying out the checks mentioned in paragraph 4.3 an increase of stress in a structural member arising from increased loading does not necessarily indicate that the roof structure is less compliant than the original roof provided an adequate factor of safety is maintained.

4.7 Where work will significantly decrease the roof dead loading, the roof structure and its anchorage to the supporting structure should be checked to ensure that an adequate factor of safety is maintained against uplift of the roof under imposed wind loading.

A3 DISPROPORTIONATE COLLAPSE

The Requirement A3

This Guernsey Technical Standard deals with the following requirements which are contained in the Building Regulations.

Requirement	*Limits on application*
Disproportionate collapse	
A3. The building must be constructed so that in the event of an accident the building will not suffer collapse to an extent disproportionate to the cause	

Guidance

Performance

The requirement of A3 will be met by an appropriate choice of measures to reduce the sensitivity of a building to disproportionate collapse should an accident occur.

Introduction

A3.1 The guidance in Section 5 deals with the means of meeting this performance criterion.

Section 5: Reducing the sensitivity of the building to disproportionate collapse in the event of an accident

5.1 The requirement will be met by adopting the following approach for ensuring that the building is sufficiently robust to sustain a limited extent of damage or failure, depending on the class of the building, without collapse.

a. Determine the building's consequence class from Table 11.

b. **For Consequence Class 1 buildings –** Provided the building has been designed and constructed in accordance with the rules given in this Guernsey Technical Standard, or other guidance referenced under Section 1, for meeting compliance with requirement A1 and A2 in normal use, no additional measures are likely to be necessary.

c. **For Consequence Class 2a buildings -** Provide effective horizontal ties, or effective anchorage of suspended floors to walls, as described in the Codes and Standards listed under paragraph 5.2 for framed and load-bearing wall construction (the latter being defined in paragraph 5.3 below).

d. **For Consequence Class 2B buildings –** Provide effective horizontal ties, as described in the Codes and Standards listed under paragraph 5.2 for framed and load-bearing wall construction (the latter being defined in paragraph 5.3 below), together with effective vertical ties, as defined in the Codes and Standards listed under paragraph 5.2, in all supporting columns and walls.

Table 10 **Building consequence classes**

Classes	Building type and occupancy
1	Houses not exceeding 4 storeys
	Agricultural buildings
	Buildings into which people rarely go, provided no part of the building is closer to another building, or area where people do go, than a distance of 1.5 times the building height
2a	5 storey single occupancy houses
	Hotels not exceeding 4 storeys
	Flats, apartments and other residential buildings not exceeding 4 storeys
	Offices not exceeding 4 storeys
	Industrial buildings not exceeding 3 storeys
	Retailing premises not exceeding 3 storeys of less than 2000m² floor area in each storey
	Single-storey educational buildings
	All buildings not exceeding 2 storeys to which members of the public are admitted and which contain floor areas not exceeding 2000m² at each storey
2b	Hotels, flats, apartments and other residential buildings greater than 4 storeys but not exceeding 15 storeys
	Educational buildings greater than 1 storey but not exceeding 15 storeys
	Retailing premises greater than 3 storeys but not exceeding 15 storeys
	Hospitals not exceeding 3 storeys
	Offices greater than 4 storeys but not exceeding 15 storeys
	All buildings to which members of the public are admitted which contain floor areas exceeding 2000m² but less than 5000m² at each storey
	Car parking not exceeding 6 storeys
3	All buildings defined above as Class 2A and 2B that exceed the limits on area and/or number of storeys
	Grandstands accommodating more than 5000 spectators
	Buildings containing hazardous substances and/or processes

Notes:

1. For buildings intended for more than one type of use the Class should be that pertaining to the most onerous type.
2. In determining the number of storeys in a building, basement storeys may be excluded provided such basement storeys fulfil the robustness requirements of Class 2B buildings.
3. BS EN 1991-17:2006 with its UK National Annex also provides guidance that is comparable to Table 10

Alternatively, check that upon the notional removal of each supporting column and each beam supporting one or more columns, or any nominal length of load-bearing wall (one at a time in each storey of the building), the building remains stable and that the area of floor at any storey at risk of collapse does not exceed 15% of the floor area of the floor area of that storey or 100m^2, whichever is smaller, and does not extend further than the immediate adjacent storeys (see Diagram 22).

Where the notional removal of such columns and lengths of walls would result in an extent of damage in excess of the above limit, then such elements should be designed as a 'key element' as defined in paragraph 5.3 below.

e. For Consequence Class 3 buildings – A systematic risk assessment of the building should be undertaken taking into account all the normal hazards that may reasonably be foreseen, together with any abnormal hazards.

Critical situations for design should be selected that reflect the conditions that can reasonably be foreseen as possible during the life of the building. The structural form and concept and any protective measures should then be chosen and the detailed design of the structure and its elements undertaken in accordance with the recommendations given in the Codes and Standards given in paragraph 5.2.

5.2 Details of the effective horizontal and vertical ties, together with the design approaches for checking the integrity of the building following the notional removal of vertical members and the design of key elements, are available in the following Codes and Standards:

BS EN 1990:2002+A1:2005 Eurocode - Basis of structural design; with UK National Annex to BS EN 1990:2002+A1:2005

BS EN 1991-1-7:2006 Eurocode 1:Actions on structures - Part 1.7: General actions - Accidental actions; with UK National Annex to BS EN 1991-1-7: 2006 and BSI PD 6688-1-7: 2009

BS EN 1992-1-1:2004 Eurocode 2: Design of concrete structures - Part 1.1: General rules and rules for buildings; with UK National Annex to BS EN 1992-1-1:2004 and BSI PD 6687-1:2010

BS EN 1993-1-1:2005 Eurocode 3: Design of steel structures - Part 1.1 General rules and rules for buildings; with UK National Annex to BS EN 1993-1-1:2005

BS EN 1994-1-1:2004 Eurocode 4: Design of composite steel and concrete structures - Part 1.1: General rules and rules for buildings; with UK National Annex to BS EN 1994-1-1:2004

BS EN 1995-1-1:2004+A1:2008 Eurocode 5: Design of timber structures - Part 1.1: General - Common rules and rules for buildings; with UK National Annex to BS EN 1995-1-1:2004+A1:2008 and BSI PD 6693-1:2012

BS EN 1996-1-1:2005+A1:2012 Eurocode 6: Design of masonry structures - Part 1.1: General rules for reinforced and unreinforced masonry structurs; with UK National Annex to BS EN 1996-1-1:2005+A1:2012 and BSI PD 6697:2010

BS EN 1999-1-1:2007+A1:2007+A1:2009 Eurocode 9: Design of aluminium structures - Part 1.1: General structural rules; with UK National Annex to BB EN 1999-1-1:2007+A1:2009 and BSI PD 6702-1:2009

Definitions

5.3 Nominal length of load-bearing wall

The nominal length of load-bearing wall construction referred to in 5.1d should be taken as follows:

– in the case of a reinforced concrete wall, the distance between lateral supports subject to a maximum length not exceeding 2.25H.

– in the case of an external masonry wall, or timber or steel stud wall, the length measured between vertical lateral supports.

– in the case of an internal masonry wall, or timber or steel stud wall, a length not exceeding 2.25H.

where H is the storey height in metres.

Key elements

A 'key element', as referred to in paragraph 5.1d, should be capable of sustaining an accidental design loading of 34kN/m^2 applied in the horizontal and vertical directions (in one direction at a time) to the member and any attached components (e.g. cladding etc.) having regard to the ultimate strength of such components and their connections. Such accidental design loading

should be assumed to act simultaneously with all other design loadings (i.e. wind and imposed loading) in accidental actions loading combination.

Load-bearing construction

For the purposes of this Guidance the term 'load-bearing wall construction' includes masonry cross-wall construction and walls comprising close centred timber or lightweight steel section studs.

Alternative approach

5.4 As an alternative to Table 10 for any building which does not fall into the classes listed under Table 10, or for which the consequences of collapse may warrant particular examination of the risks involved, performance may be demonstrated using the recommendations given in the following Reports and publication:

'*Guidance on Robustness and Provision against Accidental Actions' dated July,1999.*

Proposed Revised Guidance on meeting Compliance with the Requirements of Building Regulation Part A3'. Revision of the Allott and Lomax proposals. Project Report No. 205966.

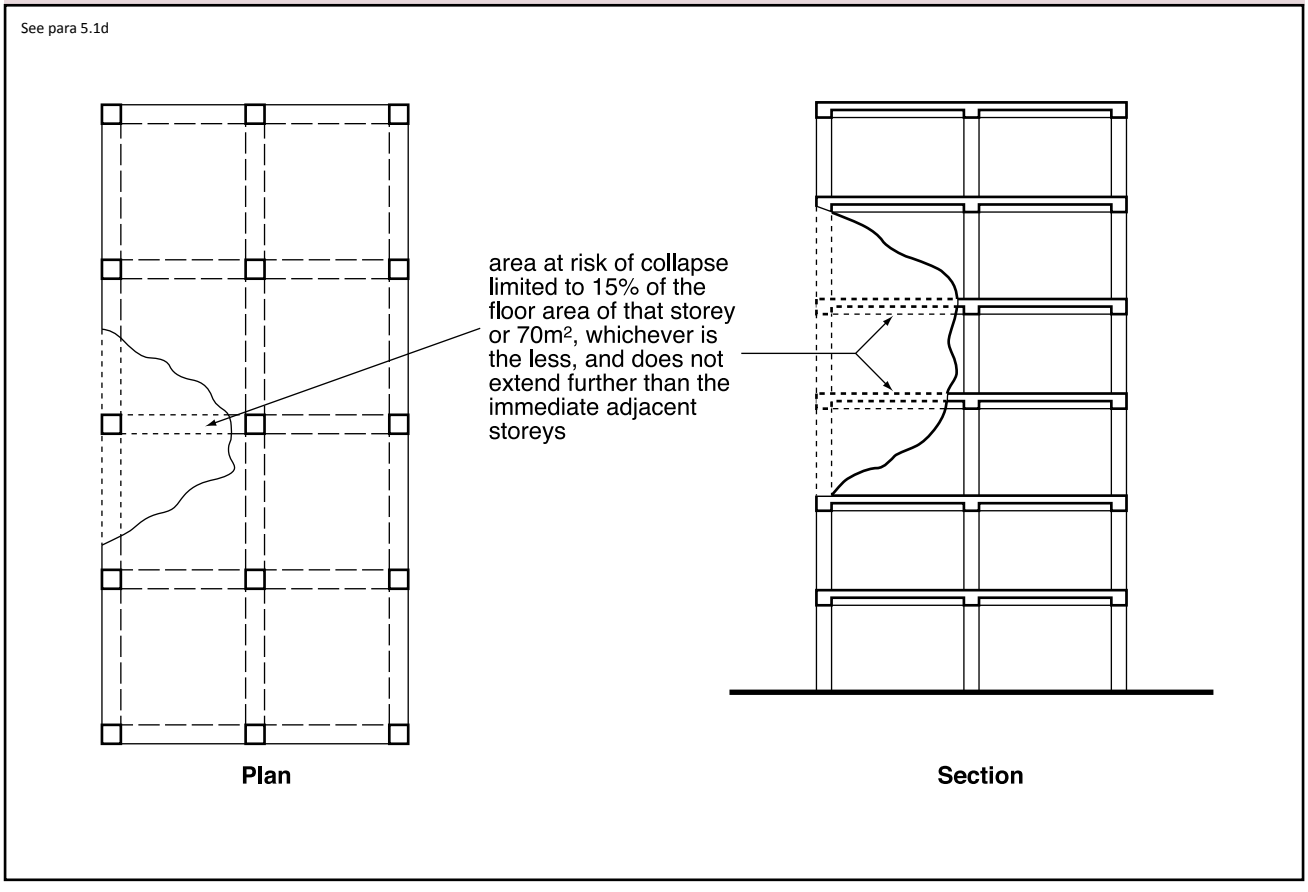
Both of the above documents are available on www.planning protal.gov.gg

Practical Guide to Structural Robustness and 'Disproportionate Collapse in Buildings' dated October 2010. Published by The Institution of Structural Engineers, London.

Seismic design

5.5 Seismic design is not usually required for buildings classified by Table 10 as being in Consequence Classes 1, 2a and 2b. For buildings classed as Consequence Class 3 the risk assessment should consider if there is any need to carry out seismic design, although such a need is not an explicit requirement for these buildings.

Diagram 22 **Area at risk of collapse in the event of an accident**



The Requirement A4

This Guernsey Technical Standard deals with the following requirements which are contained in the Building Regulations.

Requirement	*Limits on application*
Swimming pools and reservoirs **A4**. Swimming pools and reservoirs must be constructed so that - (a) they are impervious to liquid; and (b) they will not damage the structure of any other building or road.	

A4 SWIMMING POOLS AND RESERVOIRS

Guidance

Performance

The requirement of A4 will be met by adopting guidance in Sections 6 and 7.

Section 6 gives guidance on the provisions for Swimming Pools.

Section 7 gives guidance on the provisions for Reservoirs.

Section 6: Siting and Construction of swimming pools

Distance of swimming pool from buildings or roads

6.1 The critical distance for determining the type and acceptable form of pool construction is 6 meters. At a greater distance than this it is considered that if the pool should leak it will not adversely affect the foundations of any adjoining building or road.

Types of swimming pool in common use

6.2 The following types of pool are widely used and are generally acceptable if sited at least 6 meters from any building or road:

a Butyl liner over rendered concrete blockwork walls;

b Butyl liner over fibreglass in sections;

c Butyl liner over steel walls

d Mass concrete blockwork walls;

e Prefabricated fibreglass units;

f Precast wall units;

g Cavity concrete blockwork walls with reinforced concrete core;

h Reinforced concrete (temporarily shuttered walls);

i Sprayed concrete.

All pools with an element of reinforced concrete should be designed in accordance with the recommendations of *BS EN 1992-1-1:2004.*

Pool types f,g,h and i are also generally acceptable within 6 meters of a building or road providing they have been designed in accordance with the recommendations of *BS EN 1992-3:2006*

Additional Factors to be considered

6.3 If the base of the pool is above the adjoining buildings ground floor or road's ground level then the following additional work will be required to be carried out:

1 Pool types 'a' to 'd' will depend upon actual circumstances and must be discussed with Building Control prior to any commencement of works;

2 Pool types 'f' and 'g' must be rendered inside and out;

3 Pool types 'h' and 'i' must be rendered inside.

If the base of the pool is below the level of the highest normal ground water table then pool types 'a' 'b' 'c' 'd' should not be installed, and pool types 'e' 'f' 'g' 'h' and 'i' must be fitted.

If the ground bearing capacity is very low (typically less than 50kN/sq.m) then the design of any of the pool types will be required to be checked and modified if necessary.

Section 7: Reservoirs - General Design Guidance

7.1 Where the site conditions are not unusual compliance with the following recommendations will generally be deemed to satisfy the Building Regulations.

Overflow

7.2 An overflow must be provided to all reservoirs, in accordance with the requirements of H7 of Schedule 1 of the Building Regulations, which may be piped to a stream, surface water drain or to a soakaway.

Fencing

7.3 The structure must be provided with fencing in accordance with the requirements of K6 of Schedule 1 of the Building Regulations and with the Safety of Pits Ordinance, 1973.

Lined Earth Reservoirs

7.4 Liners - An adequate liner must be provided to all lined earth reservoirs. All liners must be fixed in accordance with the manufacturers instructions and in addition;

1 butyl rubber must not be less than 0.75mm (0.030") in thickness. If laid without any special protection it will be accorded a life expectancy of 15 years

2 polyvinyl chloride (PVC) must not be less than 0.35mm (0.015") in thickness. If laid without any special protection from ultra-violet degradation it will be accorded a life expectancy of no more than 2 years

3 other material will be assessed in the light of the data issued by the particular manufacturer and a life expectancy determined.

7.5 Depth - The depth shall not exceed 5m and must be wholly above the known water table.

7.6 Banks - Banks must be constructed in accordance with the guidance given in *CIRA report 161 Small embankment reservoirs*, and so as to be structurally stable bearing in mind the expected loadings

Annex A - Standards referred to and other documents

A1/2

BS 5080-1:1993
Structural fixings in concrete and masonry. Method of test for tensile loading.

BS 8103-1:2011
Structural design of low-rise buildings. Code of practice for stability, site investigation, foundations and ground floor slabs for housing.

BS 8103-2:2005

Structural design of low-rise buildings. Code of practice for masonry walls for housing.

BS 8103-3:2009
Structural design of low-rise buildings. Code of practice for timber floors and roofs for housing.

BS 8297:2000
Code of practice for design and installation of non-loadbearing precast concrete cladding. AMD 11064 2000, AMD 13018 2000.

BS 8298-1:2010
Code of practice for design and installation of natural stone cladding and lining. General

BS 8298-2:2010
Code of practice for design and installation of natural stone cladding and lining. Traditional handset external cladding

BS 8298-3:2010
Code of practice for design and installation of natural stone cladding and lining. Stone-faced pre-cast concrete cladding systems

BS 8298-4:2010
Code of practice for design and installation of natural stone cladding and lining. Rainscreen and stone on metal frame cladding systems

BS 8500-1:2006+A1:2012
Concrete. Complementary British Standard to BS EN 206-1. Method of specifying and guidance for the specifier.

BS 8500-2:2006+A1:2012
Concrete. Complementary British Standard to BS EN 206-1. Specification for constituent materials and concrete.

BS EN 197-1:2011
Cement. Composition, specifications and conformity criteria for common elements.

BS EN 197-2:2000
Cement. Conformity evaluation.

BS EN 771-1:2011
Specification for masonry units. Clay masonry units.

BS EN 771-2:2011
Specification for masonry units. Calcium silicate masonry units.

BS EN 771-3:2011
Specification for masonry units. Aggregate concrete masonry units (dense and light-weight aggregates). AMD 16001

BS EN 771-4:2011
Specification for masonry units. Autoclaved aerated concrete masonry units.

BS EN 771-5:2011
Specification for masonry units. Manufactured stone masonry units.

BS EN 771-6:2011
Specification for masonry units. Natural stone masonry units.

BS EN 845-1:2003+A1:2008
Specification for ancillary components for masonry. Ties, tension straps, hangers and brackets. AMD 14736 2003, AMD 15539 2006

BS EN 845-2:2003
Specification for ancillary components for masonry. Lintels.

BS EN 845-3:2003+A1:2008
Specification for ancillary components for masonry. Bed joint reinforcement of steel meshwork.

BS EN 998-2:2010
Specification for mortar for masonry. Masonry mortar. AMD July 2011

BS EN 1090-2:2008+A1:2011
Execution of steel structures and aluminium structures - Part 2: Technical requirements for the execution of steel structures

A STANDARDS REFERRED TO

BS EN 1090-3:2008
Execution of steel structures and aluminium structures - Part 3: Technical requirements for aluminium structures

BS EN 1990:2002+A1:2005
Eurocode - Basis for structural design; with UK National Annex to BS EN 1990:2002+A1:2005

BS EN 1991-1-1:2002
Eurocode 1: Actions on structures - Part 1.1: General actions - Densities, self weight, imposed loads for buildings; with UK National Annex to BS EN 1991-1-1:2002

BS EN 1991-1-3:2003
Eurocode 1: Actions on structures - Part 1.3:2003 General actions _ Snow loads; with UK National Annex to BS EN 1991-1-3:2003

BS EN 1991-1-4:2005+A1:2010
Eurocode 1: Actions on structures - Part 1,4: General actions - Wind actions; with UK National Annex to BS EN 1991-1-4:2005+A1:2010

BS EN 1991-1-5:2003
Eurocode 1: Actions on structures - Part 1.5: General actions - Thermal actions; with UK National Annex to BS EN 1991-1-5:2003

BS EN 1991-1-6:2005
Eurocode 1: Actions on structures - Part 1.6: General actions - Actions during execution; with UK National Annex to BS EN 1996-1-6:2005

BS EN 1991-1-7:2006
Eurocode 1: Actions on structures - Part 1.7: General actions - Accidental actions; with UK National Annex to BS EN 1991-1-7:2006

BS EN 1991-3:2006
Eurocodes 1: Actions on structures - Part 3: Actions induced by cranes and machinery; with UK National Annex to BS EN 1991-1:2006

BS EN 1992-1-1:2004
Eurocode 2: Design of concrete structures - Part 1.1: General rules and rules for buildings: with Uk National Annex to BS EN 1992-1-1:2004

BS EN 1993-1-1:2005
Eurocode 3: Design of steel structures - Part 1.1: General rules and rules for buildings; with UK National Annex to BS EN 1993-1-1:2005

BS EN 1993-1-3:2006
Eurocode 3: Design of steel structures - Part 1.3: General rules - Supplementary rules for cold-formed members and sheeting;with UK National Annex to BS EN 1993-1-3:2006

BS EN 1993-1-4:2006
Eurocode 3: Design of steel structures - Part 1.4: General rules - Supplementary rules for stainless steels; with UK National Annex to BS EN 1993-1-4:2006

BS EN 1993-1-5:2006
Eurocode 3: Design of steel structures - Part 1.5: Plates structural elements; with UK National Annex to BS EN 1993-1-5:2006

BS EN 1993-1-6:2007
Eurocode 3: Design of steel structures - Part 1.6: Strength and stability of shell structures

BS EN 1993-1-7:2007
Eurocode 3: Design of steel structures - Part 1.7: Plated structures subject to out of plane loading

BS EN 1993-1-8:2005 *Eurocode 3: Design of steel structures - Part 1.8: Design of joints; with UK National Annex to BS EN 1993-1-8:2005*

BS EN 1993-1-9:2005
Eurocode 3: Design of steel structures - Part 1.9: Fatigue; with UK National Annex to BS EN 1993-1-9:2005

BS EN 1993-1-10:2005
Eurocode 3: Design of steel structures - Part 1.10: Material toughness and through-thickness properties; with UK National Annex to BS EN 1993-1-10:2005

BS EN 1993-1-11:2006
Eurocode 3: Design of steel structures with tension components; with UK National Annex to BS EN 1993-1-11:2006

BS EN 1993-1-12:2007
Eurocode 3: Design of steel structures - Part 1.12: Additional rules for the extension of EN 1993 up to steel grades S 700; with UK National Annex to BS EN 1993-1-12:2007

BS EN 1993-5:2007
Eurocode 3: Design of steel structures - Part 5: Piling; with UK National Annex to BS EN 1993-5:2007+A1:2012

BS EN 1993-6:2007
Eurocode 3: Design of steel structures - Part 6: Crane supporting structures; with UK National Annex to BS EN 1993-6:2007

BS EN 1994-1-1:2004
Eurocode 4 Design of composite steel and concrete structures - Part 1.1: General rules and rules for buildings; with UK National Annex to BS EN 1994-1-1:2004

BS EN 1995-1-1:2004+A1:2008
Eurocode 5: Design of timber structures - Part 1.1: General - Common rules and rules for buildings; with UK National Annex to BS EN 1995-1-1:2004+A1:2008

BS EN 1996-1-1:2005+A1:2012
Eurocode 6: Design of masonry structures - Part 1.1: General rules for reinforced and unreinforced masonry structures; with UK National Annex to BS EN 1996-1-1:2005+A1:2012

BS EN 1996-2:2006
Eurocode 6: Design of masonry structures - Part 2: Design considerations, selection of materials and execution of masonry; with UK National Annex to BS EN 1996-2:2006

BS EN 1996-3:2006
Eurocode 6: Design of masonry structures - Part 3: Simplified calculation methods for unreinforced masonry structures; with UK National Annex to BS EN 1996-3:2006

BS EN 1997-1:2004
Eurocode 7: Geotechnical design - Part 1: General rules; with UK National Annex to BS EN 1997-1:2004

BS EN 1997-2:2007
Eurocode 7: Geotechnical design - Part 2: Ground investigation and testing; with UK National Annex to BS EN 1997-2:2007

BS EN 1998-1:2004+A1:2013
Eurocode 8: Design of structures for earthquake resistance - Part 1: General rules, seismic actions and rules for buildings; with UK National Annex to BS EN 1998-1:2004

BS EN 1998-5:2004
Eurocode 8: Design of structures for earthequake resistance - Part 5: Foundations, retaining structures and geotechnical aspects; with UK National Annex to BS EN 1998-5:2004

BS EN 1999-1-1:2007+A1:2009
Eurocode 9: Design of aluminium structures - Part 1.1: General structural rules; with UK National Annex to BS EN 1999-1-1:2007+A1:2009

BS EN 1999-1-3:2007+A1:2011
Eurocode 9: Design of aluminium structures - Part 1.3: Structures susceptible to fatigue; with UK National Annex to BS EN 1999-1-3:2007+A1:2011

BS EN 1999-1-4:2007+A1:2011
Eurocode 9: Design of aluminium structures - Part 1.4: Cold-formed structural sheeting; with UK National Annex to BS EN 1999-1-4:2007

BS EN 1999-1-5:2007
Eurocode 9: Design of aluminium structures - Part 1.5: Shell structures; with UK National Annex to BS EN 1999-1-5:2007

BS EN 12620:2002+A1:2008
Aggregates for concrete AMD 15333 2004

BS EN 13670:2009
Execution of concrete structures

BSI PD 6687-1:2010
Published Document - Background paper to the UK National Annexes to BS EN 1992-1 and BS EN 1992-3

BSI PD 6688-1-1:2011
Published Document - Recommendations for the design of structures to BS EN 1991-1-1

BSI PD 6688-1-4:2009
Published Document - Background information to the National Annex to BS EN 1991-104 and additional guidance

BSI PD 6688-1-7:2009
Published Document - Recommendations for the design of structures to BS EN 1991-1-7

BSI PD 6693-1:2012
Published Document - Recommendations for the design of timber structures to Eurocode 5: Design of timber structures Part 1: General - Common rules and rules for buildings

BSI PD 6695-1-9:2008
Published Document - Recommendations for the design of structures to BS EN 1993-1-9

BSI PD 6695-1-10:2009
Published Document - Recommendations for the design of structures to BS EN 1993-1-10

BSI PD 6697:2010
Published Document - Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2

BSI PD 6698:2009
Published Document - Recommendations for the design of structures for earthquake resistance to BS EN 1998

BSI PD 6702-1:2009
Published Document - Structural use of aluminium - Part 1: Recommendations for the design of aluminium structures to BS EN 1999

BSI PD 6705-3:2009
Published Document - Structural use of steel and aluminium - Part 3: Recommendations for the execution of aluminium structures to BS EN 1090-3

BRE Digest 437 Industrial platform floors: mezzanine and raised storage.

Guidance on the design and testing of grandstands may be found in *'Dynamic performance requirements for permanent grandstands subject to crowd action - Recommendations for management, design and assessment'* published by The Institution of Structural Engineers, December 2008.

'Span tables for solid timber members in floors, ceilings, and roofs (exclubing trussed rafter roofs) for dwellings', published by TRADA, available from Chiltern House, Stocking Lane, Hughenden Valley, High Wycombe, Bucks HP14 4ND

The Wood Protection Association's manual *'Industrial Wood Preservation: Specification and Practice' (2010),* available from 5C Flemming Court, Castleford, West Yorkshire, WF10 5HW

A3

BS EN 1990:2002+A1:2005
Eurocode - Basis of structural design; with UK National Annex to BS EN 1990:2002+A1:2005

BS EN 1991-1-7:2006
Eurocode 1:Actions on structures - Part 1.7: General actions - Accidental actions; with UK National Annex to BS EN 1991-1-7: 2006 and BSI PD 6688-1-7: 2009

BS EN 1992-1-1:2004
Eurocode 2: Design of concrete structures - Part 1.1: General rules and rules for buildings; with UK National Annex to BS EN 1992-1-1:2004 and BSI PD 6687-1:2010

BS EN 1993-1-1:2005
Eurocode 3: Design of steel structures - Part 1.1 General rules and rules for buildings; with UK National Annex to BS EN 1993-1-1:2005

BS EN 1994-1-1:2004
Eurocode 4: Design of composite steel and concrete structures - Part 1.1: General rules and rules for buildings; with UK National Annex to BS EN 1994-1-1:2004

BS EN 1995-1-1:2004+A1:2008
Eurocode 5: Design of timber structures - Part 1.1: General - Common rules and rules for buildings; with UK National Annex to BS EN 1995-1-1:2004+A1:2008 and BSI PD 6693-1:2012

BS EN 1996-1-1:2005+A1:2012
Eurocode 6: Design of masonry structures - Part 1.1: General rules for reinforced and unreinforced masonry structurs; with UK National Annex to BS EN 1996-1-1:2005+A1:2012 and BSI PD 6697:2010

BS EN 1999-1-1:2007+A1:2007+A1:2009
Eurocode 9: Design of aluminium structures - Part 1.1: General structural rules; with UK National Annex to BB EN 1999-1-1:2007+A1:2009 and BSI PD 6702-1:2009

BSI PD 6687-1:2010
Published Document - Background paper to the UK National Annexes to BS EN 1992-1 and BS EN 1992-3

BSI PD 6688-1-7:2009
Published Document - Recommendations for the design of structures to BS EN 1991-1-7

BSI PD 6693-1:2012
Published Document - Recommendations for the design of timber structures to Eurocode 5: Design of timber structures Part 1: General - Common rules and rules for buildings

BSI PD 6697:2010
Published Document - Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2

BSI PD 6698:2009
Published Document - Recommendations for the design of structures for earthquake resistance to BS EN 1998

BSI PD 6702-1:2009
Published Document - Structural use of aluminium - Part 1: Recommendations for the design of aluminium structures to BS EN 1999

Practical Guide to Structural Robustness and 'Disproportionate Collapse in Buildings' dated October 2010. Published by The Institution of Structural Engineers, London.

A4

BS EN 1992-3:2006
Eurocode 2. Design of concrete structures, Liquid retaining and containing structures.

BS EN 1992-1-1:2004
Eurocode 2. Design of concrete structures. General rules and rules for buildings.

CIRA report 161 Small embankment reservoirs.

BRE Digest 366: Structural Appraisal of Existing Buildings for Change of Use.

The Institution of Structural Engineers Report Appraisal of Existing Structures, 1996

A Annex B - Key terms

The following meanings apply to terms throughout this document:

Buttressing wall A wall designed and constructed to afford lateral support to another wall perpendicular to it, support being provided from the base to the top of the wall.

Cavity width The horizontal distance between the two leaves of a cavity wall.

Compartment wall A wall constructed as a compartment wall to meet the requirements of requirement B3(2).

Dead load The load due to the weight of all walls, permanent partitions, floors, roofs and finishes including services, and all other permanent construction.

Imposed load The load assumed to be produced by the intended occupancy or use, including the weight of movable partitions, distributed, concentrated, impact, inertia and snow loads, but excluding wind loads.

Pier A member which forms an integral part of a wall, in the form of a thickened section at intervals along the wall, so as to afford lateral support to the wall to which it is bonded or securely tied.

Separating wall A wall or part of a wall which is common to adjoining buildings, and constructed to meet the requirements of requirement B3(2).

Spacing The distance between the longitudinal centres of any two adjacent timber members of the same type, measured in the plane of floor, ceiling or roof structure.

Span The distance measured along the centre line of a member between the centres of any two adjacent bearings or supports.

Supported wall A wall to which lateral support is afforded by a combination of buttressing walls, piers or chimneys acting in conjunction with floor(s) or roof.

Wind load The load due to the effect of wind pressure or suction.

GUERNSEY TECHNICAL STANDARDS

The following documents have been approved and issued by the Development and Planning Authority for the purpose of providing practical guidance with respect to the requirements of the Building Regulations

Guernsey Technical Standard A: Structure, 2017 edition.

Guernsey Technical Standard B: Fire Safety - Volume 1 - Dwellinghouses, 2012 edition with May 2016 amendments.

Guernsey Technical Standard B: Fire Safety - Volume 2 - Buildings other than dwellinghouses, 2012 edition with May 2016 amendments.

Guernsey Technical Standard C: Site preparation and resistance to contaminants and moisture 2012 edition with May 2016 amendments.

Guernsey Technical Standard D: Toxic substances 2012 edition with May 2016 amendments.

Guernsey Technical Standard E: Resistance to the passage of sound, 2012 edition with May 2016 amendments.

Guernsey Technical Standard F: Ventilation, 2012 edition with May 2016 amendments.

Guernsey Technical Standard G: Health, hygiene and water efficiency, 2012 edition with May 2016 amendments.

Guernsey Technical Standard H: Drainage and waste disposal, 2012 edition with May 2016 amendments.

Guernsey Technical Standard J: Heat producing appliances and fuel storage systems, 2012 edition with May 2016 amendments.

Guernsey Technical Standard K: Safe means of access and egress, 2012 edition with May 2016 amendments.

Guernsey Technical Standard L1: Conservation of fuel and power – Dwellings, 2012 edition with May 2016 amendments.

Guernsey Technical Standard L2: Conservation of fuel and power – Buildings other than dwellings, 2012 edition with May 2016 amendments.

Guernsey Technical Standard M: Access to and use of buildings, 2012 edition with May 2016 amendments.

Guernsey Technical Standard N: Glazing - Materials and protection, 2012 edition with May 2016 amendments.

Guernsey Technical Standard P: Roads - Layout design and construction, 2012 edition with May 2016 amendments.

Guernsey Technical Standard Regulation 11: Materials and Workmanship, 2012 edition with May 2016 amendments.

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