

PreCIS Essential list – Timber in construction

These References cite the titles, and abstracts, of documents of fundamental relevance to this construction area. Building regulations and other pertinent legislation are not included. The documents cited were current at the time the selection was made, but may have since been superseded or replaced.

Timber building systems/frame

Architects' Journal

[*Framed original, the Waldie house. AJ 21/31.8.88*](#)

[*Finnish frames. AJ 10.7.85*](#)

[*Building with timber. AJ 14.07.93*](#)

[*Shell suits museum. AJ 17.9.98*](#)

Outlines how a timber grid shell, complex to engineer but simple to erect, will be used to provide more space for the Weald and Downland Museum in Sussex.

[*Theatre in the frame. Theatre at Bedales School. AJ 15.2.96*](#)

[*Building a timber frame. AJ 25.3.92*](#)

[*Shakespearian re-enactment. AJ 13.1.93*](#)

[*Construction Study: Design and build - by an architect. Family house. AJ 25.8.94*](#)

[*Architects' Journal Technical and Practice*](#) *Wooden performance. AJ 09.09.2004*

Looks at timber construction which is experiencing another revival. Includes case study.

[*Architects' Journal Technical*](#) *Next steps in timber. AJ 17.4.97*

If timber is to continue to be regarded as a green [environmentally friendly and energy saving] material, its engineering possibilities must be explored. Briefly mentions some UK examples and given details of the gym of Rockridge school, Canada which uses timber Vierendeel trusses and glulam.

[*Architects' Journal Technical*](#) *The dating game. AJ 23.03.2000*

First of three articles on how to estimate the date of buildings. Looks at the history of building in masonry and in timber

[*Architects' Journal Technical*](#) *Timber building US-style. AJ 27.02.97*

A recent tour of the USA showed the potential for timber-based frames, components, and building systems

[*Architects' Journal Technical*](#) *Update on timber. AJ 02.09.1999*

Looks at the increasing use of timber for structural applications and the wide range of ready-made products which are now available. These include glulam sections, facade cladding systems including rainscreen and grid shells. 'Timber briefing' lists useful publications on the subject.

[*Architects' Journal Technical*](#) *Homes out of the wood. AJ 03.9.98*

Five architects have designed innovative timber houses focusing on either production techniques, sustainability or structures, components and materials. The Timber

features. Gives working details of a timber frame structure with louvre screen and rooflights. Architects: Form Design Group.

[Architects' Journal Working Details](#) *Timber cruck frame structure. AJ 15.7.04*

Looks at the timber cruck frame structure of the conference centre at Alec French Partnership's Kindersley Centre at Sheepdrove Organic Farm, which is designed on environmentally responsible principles.

[Architects' Journal Working Details](#) *In tune with nature. AJ 17.9.98*

Outlines how reclaimed Green Oak timber has been used to construct the frame of a music studio in Bath

[Architects' Journal Working Details](#) *Structure and roof: heritage centre. AJ 23.10.91*

[Architects' Journal Working Details](#) *A skill centre built by its users. AJ 17.2.93*

Engineered Wood Association

[American plywood for timber frame construction](#)

This publication summarises plywood application recommendations for timber frame construction, including floors, wall sheathing, cladding, and roof sheathing.

[Substitution of glulam beams for steel or solid-sawn lumber](#)

Glued laminated timber (glulam) beams of equal or greater strength and stiffness can often be substituted for sawn lumber or steel beams. This American Wood Systems publication provides tables for equivalent glulam beams.

[Product and application guide : Glulams](#)

This publication describes APA EWS trademarked glulams, addresses important design considerations, and includes a guide of recommended specifications. It also highlights just a few of the many applications where glulams are being used today in construction.

[Glued laminated beam design tables](#)

Glued laminated beams (glulams) are used in a wide range of applications in both commercial and residential construction. The tables in this Engineered Wood Systems Data File provide recommended preliminary design loads for two of the most common glulam beam applications: roofs and floors. The tables included in this data file include values for section properties and capacities, and allowable loads for simple span and cantilevered beams.

[Glulams in residential construction](#)

This publication describes APA EWS trademarked glulams and highlights just some of the ways they can be used in residential construction.

[House building basics](#)

This brochure from APA is designed as an elementary guide to wood-frame construction. It illustrates the basic steps to completing the structural shell of a typical single-storey house - from the foundation to the roof.

[Wood structural panels over metal framing](#)

In roof, floor, and wall applications, wood structural panels are often applied directly to metal framing or decking. This brochure describes typical assemblies for wood structural panels attached to metal framing in floor, wall, and roof construction.

[Diaphragms](#)

A diaphragm is a flat structural unit acting like a deep, thin beam. The term "diaphragm" is usually applied to roofs and floors. A shear wall, however, is a vertical, cantilevered diaphragm. A diaphragm structure results when a series of such diaphragms are properly tied together to form a structural unit. When diaphragms and shear walls are used in the lateral design of a building, the structural system is termed a "box system".

[Structural insulated panels](#)

Structural insulated panels are high-quality engineered construction products that combine several important components into a building system. Sometimes referred to as 'sandwich panels' or 'foam core panels', structural insulated panels (SIPs) are composed of a thick plastic foam layer sandwiched between two structural wood panel faces. The rigid plastic foam provides high insulation values while the structural panel faces contribute to the system's overall stiffness, strength and dimensional stability. Structural insulated panels are used in residential and low-rise commercial construction. They are used most often as roof or wall panels, but also can be used in floor construction and for other components such as dormers and window bays. They can be custom manufactured to match specific building plans. This publication from APA - The Engineered Wood Association describes the composition and features of structural insulated panels and provides examples of the types of construction applications where they can be used.

[Fire-rated systems](#)

This publication is designed to bring the reader up to date with what are considered today among the most cost-effective fire-rated construction systems that can be designed or built - wood and wood structural panel systems. It provides hard facts about what's available, what's acceptable, and what's best practice.

[Performance standards and policies for structural-use panels](#)

This publication is divided into six main sections; manufacturing and performance standard for APA rated Sturd-I-Floor panels; manufacturing and performance standard for APA rated sheathing panels; manufacturing and performance standard for APA rated siding panels; APA qualification policy for trademarking privileges for structural-use panels; APA quality assurance policy for structural-use panels and; manual of APA test methods for structural-use panels.

British Board of Agreement

[Certificate 92/2813 Trus Joist MacMillan - Limited Partnership. Parallam PSL \(parallel strand lumber\). Third issue](#)

Wood-based material for use in structural members (e.g. beams, ties, struts) or structural framing and also for the fabrication of built-up components such as trusses and panels.

[Certificate 97/3369](#) *Trus Joist. Timberstrand LSL. Second issue*

A wood-based material for use in structural members (e.g. beams, ties, struts) or structural framing and also for the fabrication of built-up components such as trusses and panels.

[Certificate 99/3620](#) *Boise Cascade Sales Ltd. BCI joists*

Joists fabricated from reconstituted timber for use as structural members such as floor or roof joists, beams, rafters and wall studs.

[Certificate 99/3633](#) *James Jones and Sons Ltd. JJI-Joists*

Joists fabricated from solid and reconstituted timber for use as structural members. Includes detail sheet - (2) Solid timber or laminated veneer lumber flanges and oriented strand board webs

[Certificate 00/3717](#) *Finnforest Corporation. Kerto LVL (laminated veneer lumber)*

A wood based material for use in structural members or structural framing and also for the fabrication of built up components such as trusses and panels.

[Certificate 02/3950](#) *Second nature (UK) Ltd. Thermafleecce*

Relates to Thermafleecce, thermal insulation batts, designed to be used in dwellings and buildings with similar temperature and humidity conditions. The batts can be used in loft applications between joists in ventilated and unventilated lofts under pitched roofs and between rafters for tiled or slated pitched roofs designed and constructed in accordance with the relevant clauses of BS 5534-1: 1997. They are also for use in timber-frame wall applications between studding with a weather-resistant cladding and a ventilated and drained cavity. Detail sheets cover: (2) Loft insulation, (3) Sarking and (4) Timber frame.

[Certificate 02/3966](#) *Hunton Fiber (UK) Ltd. Hunton bitroc and Hunton bitvent*

Relates to Hunton bitroc and Hunton bitvent, bitumen-impregnated insulation board. This product is designed to be used as a structural sheathing on timber frame dwellings.

[Information Sheet 6](#) *Assessment of factory-made structural timber products*

[MOAT 26](#) *Assessment of structural sheathing for wall panels for timber-framed dwellings*

BRE Certification

[Certificate 038/96](#) *MiTek M20 punched metal plate timber fasteners (March 2005 reissue)*

Document History - Previous edition issued by WIMLAS.

MiTek M20 punched metal plate timber fasteners have been assessed to confirm their suitability for use as mechanical fastenings for joints in factory-manufactured timber structural components in which all members lie in one plane. The fasteners are galvanised steel plates with integral nails that are fully pressed into the adjoining timber members.

[Certificate 108/03](#) *Beamlock structural framing system*

Document History - See also building certificates published by WIMLAS.

For use in single storey construction, and comprises factory produced proprietary timber and metal components assembled on site to form loadbearing elements of a construction.

BRE

[Defect Action Sheet 75](#) *External walls: brick cladding to timber frame - the need to design for differential movement*

[Defect Action Sheet 76](#) *External walls: brick cladding to timber frame - how to allow for movement*

[Digest 416](#) *Specifying structural timber*

Timber which is used to sustain loads in buildings is said to be 'structural'. It includes joists which support ceilings, floors and flat roofs, and the rafters and purlins of traditionally built pitched roofs. If timber is correctly specified at the design stage, it is more likely to be supplied and fitted without trouble and will give better service throughout the life of the building. This Digest discusses those aspects which should be considered in a specification for structural timber and provides a guide to the fuller information contained in relevant British Standards, European CEN Standards, and other documents, listed in the digest.

[Digest 423](#) *Structural use of wood-based panels: a commentary on the changes ahead with European standardisation*

This Digest discusses available approaches to structural design with wood-based panels. UK practice is currently regulated by British Standards but European standards will come into force by January 2004. This Digest explains the differences between the European and the UK approach, and the impact that the adoption of European standards will have on UK standards and practice. It gives timescales for the phases of change and information on options available to the designer at each stage. Designers will be able to determine how structural design will be affected by the adoption of European standards and codes.

[Digest 445](#) *Advances in timber grading*

BRE has played a leading role in the development and implementation of methods for the grading of structural timber by visual and mechanical means. This digest reviews current developments and presents new information in the grading of structural timbers in accordance with BS 5268: Part 2. It also presents the grade stresses for sweet chestnut, for larger-section Douglas fir and for Trussed Rafter grades TR26/TR20, together with a review of the density values for British grown Sitka spruce.

[Digest 470](#) *Life cycle impacts of timber: a review of the environmental impacts of wood products in construction*

The environmental performance of construction is of increasing importance. Building impacts arise mainly from operation, but also from environmental impacts 'embodied' in the fabric of the building. Using Life Cycle Assessment (LCA), environmental impacts of construction products can be compared and the impacts of extraction,

manufacture, use and disposal can be measured. Using BRE's industry-agreed approach, an LCA of timber products shows that in many applications timber has a low environmental impact. Contains guidance to help construction professionals take advantage of the excellent performance of timber products.

[Digest 479](#) *Timber piles and foundations*

Gives information on the design and installation of timber piling, its history and background, suitable timber species and preservative treatment.

[Digest 496](#) *Timber frame buildings. A guide to the construction process*

Follows the procurement and construction process, then describes the various elements of a timber frame and the main types of TF construction (platform frame, floor-to-floor panel frame, vertical panel frame, volumetric). Three case studies describe the benefits experienced from using timber frame compared with traditional methods.

[Good Building Guide 11](#) *Supplementary guidance for assessment of timber-framed houses: Part 1 examination*

This two-part guide supplements existing inspection procedures for timber-framed houses. Part 1 includes guidance on visual re-examination of the building exterior and interior and then considers how to examine the wall cavity and frame if a deficiency related to structural stability, durability or fire protection is suspected.

[Good Building Guide 12](#) *Supplementary guidance for assessment of timber-framed houses: Part 2 interpretation*

With timber-framed houses, site findings and observations require careful interpretation during the preparation of a condition report. This Guide shows how to assess the significance of key observations and readings which may have been taken during an earlier survey or supplementary inspection. This guide includes new advice for assessing building condition, and identifying any need for remedial work. Although intended for use with conventional timber frame design, the guidance has general applicability to less common timber frame systems.

[Information Paper 28/80](#) *Relations between the moduli of elasticity of structural timber in bending*

[Information Paper 1/81](#) *Vapour diffusion through timber-framed walls*

[Information Paper 7/81](#) *Machine grading British-grown Corsican pine*

[Information Paper 4/82](#) *Developments in stress grading*

[Information Paper 21/82](#) *Moisture relations in timber-framed walls*

[Information Paper 1/83](#) *Depth factor adjustments in the determination of characteristic bending stresses for visually stress graded timber*

[Information Paper 12/84](#) *Assessing the performance of timber frame wall panels subject to racking loads*

[Information Paper 1/85](#) *Surveying the moisture contents of cavity-filled timber-framed dwellings*

[Information Paper 18/85](#) *Design stresses for timber - background to BS 5268: part 2*

[Information Paper 7/88](#) *Design and manufacture of ply-web beams*

The design, manufacture and installation of ply-web beams require specialised knowledge and adequate control over all operations is necessary to achieve satisfactory performance. Examination of ply-web beam performance in service suggests that there are some areas of design and manufacture which require particular care. This Information Paper identifies these key areas and offers guidance for designers and manufacturers on how to ensure satisfactory beam performance.

[Information Paper 8/96](#) *Moisture resistance of laminated veneer lumber (LVL)*

This paper describes assessments of establishing the suitability of laminated veneer lumber (LVL) for use in moisture-hazardous environments. The lap-shear and associated pre-conditioning methods in European Standard prEN 314-1 have been identified as offering the best method for determining glue bond performance of LVL. They showed that LVL made from Finnish Norway spruce, British Sitka spruce and British poplar has considerable resistance to moisture and even to quite severe wetting.

[Information Paper 19/00](#) *Five storey timber frame hall of residence: a reconstruction case study*

describes the design and construction challenges for a replacement student hall of residence on the esplanade at Aberystwyth. The case study focuses on key features of the project with special attention given to the 5 storey timber frame structure.

[Information Paper 9/03](#) *Best practice of timber waste management*

Presents the practical issues that affect timber waste in UK construction. Describes timber sources, composition, use and waste, and markets for recycling and disposal together with the plant and machinery necessary to exploit this resource. It proposes a timber waste classification. The various types of equipment for processing waste timber are listed; legislation covering the disposal of waste timber is briefly mentioned. This material is then drawn together to provide the best practicable environmental option for timber waste, and a model is tested to provide two examples of what could be achieved.

[Report 41](#) *Timber-framed housing - a technical appraisal*

Timber-frame construction in the context of the Review is that in which all the external walls are of load bearing timber work, but some of its comments will also be appropriate to load bearing timber infill to cross-wall construction. The Review is concerned with those parts of timber-framed dwellings which differ from conventional dwellings. It considers foundations, for example, to the extent that they differ from those used in conventional construction. In the main, the Review is concerned with the load bearing timber structure and the measures required to achieve and maintain a satisfactory performance for an acceptably long life.

[Report 90](#) *Moisture conditions in the walls of timber frame houses - the effects of holes in vapour barriers*

The effects of holes in vapour barriers on the moisture content of the sheathing in timber frame walls have been studied in trials in the laboratory and using a test building. Panels of 'conventional' construction with various sheathing materials have been evaluated. This report presents the findings and discusses their implications.

[Report 228](#) *Moisture conditions in the walls of timber-framed housing*

Document History - Included in BRE Report 469 - Non traditional houses.

This report gives the results of moisture monitoring. It describes the housing sample by location, construction type and technical variety, and presents the moisture content data and data from associated microbiological and physical examinations of the timber structure. From these data, the risk of decay and other moisture-induced degrade in the houses is assessed, together with the implications for design and materials specification.

[Report 282](#) *Timber frame housing 1920-1975: inspection and assessment*

Document History - Included in BRE Report 469 - Non traditional houses.

This report gives guidance on how to inspect and assess the condition of timber frame dwellings built in the public sector between 1920 and 1975. It also identifies those parts of timber frame dwellings which require particular attention during an inspection: special emphasis is given to areas of the building where the timber might be vulnerable to wetting and decay.

[Report 283](#) *Timber frame housing systems built in the UK 1920-1965*

Document History - Included in BRE Report 469 - Non traditional houses.

This reports has three main objectives: i. to record the form of construction of timber frame dwellings built between 1920 and 1965, ii. to identify which parts of these dwellings have suffered deterioration, and. iii. to highlight the areas to which surveyors should pay particular attention when carrying out inspections.

[Report 284](#) *Timber frame housing systems built in the UK 1966-1975*

Document History - Included in BRE Report 469 - Non traditional houses.

System-built timber framed dwellings were gradually introduced into the United Kingdom from the early 1920s. Although masonry construction was the norm for housing before 1945, by the end of the Second World War about 2,000 timber framed dwellings had been built in the UK. The external walls of the early systems were typically of heavy framed or virtually solid timber planking, directly clad with timber boarding. This report has three main objectives: i. to record the form of construction of timber frame dwellings built between 1966 and 1975, ii. to identify which parts of these dwellings have suffered deterioration, and. iii. to highlight the areas to which surveyors should pay particular attention when carrying out inspections.

[Report 454](#) *Multi storey timber framed buildings: a design guide*

Document History - Can be read in conjunction with TRADA publication - Timber Frame Construction.

Focuses on aspects specific to multi-storey buildings of platform frame type construction. Design and best practice guidance is provided on: Structural stability and robustness, Fire safety, Differential movement, Construction benchmarking, and Construction process and building tolerances. Should be of interest to all building professionals responsible for the design and construction of multi-storey timber frame

buildings. Building control, local authorities and insurance companies will also benefit from the normative guidance provided for timber frame buildings

[Special Digest 2](#) *Timber frame dwellings. Conservation of fuel and power: AD LIA guidelines*

Document History - Supersedes 2002 edition.

Provides guidance on the relevant regulations for new timber frame dwellings, showing various approaches to compliance, together with four worked examples involving timber frame build solutions. Seventeen examples of timber frame wall, roof and floor constructions show how suitable U-values may be achieved for a variety of timber frame constructions. Intended for the timber frame industry, designers, architects and builders who may be considering using timber frame, and for enforcers assessing applications.

British Standards Institution

[BS 4978:1996](#) *Visual strength grading of softwood (AMD 9434)*

Document History - Supersedes BS 4978:1988

Specifies two grades for structural use. Covers softwoods graded in the UK and abroad under the supervision of a certification body approved by the UK Timber Grading Committee.

[BS 5268-2:1996](#) *Structural use of timber. Code of practice for permissible stress design, materials and workmanship (AMD 9451) (No longer current but cited in Building Regulations)*

Document History - This standard is no longer current but is cited in Building Regulations. Superseded by BS 5268-2:2002. Supersedes BS 5268-2:1991.

Provides guidance on the structural use of timber, glued laminated timber and wood based panels. Includes quality grade stresses, modification factors, joint design, testing procedures, workmanship, inspection and maintenance.

[BS 5268-2:2002](#) *Structural use of timber. Code of practice for permissible stress design, materials and workmanship*

Document History - Supersedes BS 5268-2:1996. This standard incorporates some of the European Committee for Standardization (CEN) standards on materials to ease the specification and supply of materials during the period of coexistence of BS 5268 and Eurocode 5.

Guidance and recommendations are given for structural use of timber in load-bearing members. Subjects covered include a method of test, design criteria, information on quality and grade stresses, workmanship and treatments which can be applied.

[BS 5268-4.1:1978](#) *Code of practice for the structural use of timber. Fire resistance of timber structures. Method of calculating fire resistance of timber members (AMD 2947) (AMD 6192)*

Document History - Confirmed April 2002

Methods of assessing the fire resistance of flexural tension and compression members of solid or glued laminated timber and their joints.

[BS 5268-6.1:1996](#) *Structural use of timber. Code of practice for timber framed walls. Dwellings not exceeding four storeys (AMD 9256)*

Document History - Supersedes BS 5268-6.1:1988

This standard has been updated to take account of experience with this type of construction and the issue of relevant European standards. The scope has been extended from 3 storeys to 4 storeys.

[BS 5268-6.2:2001](#) *Structural use of timber. Code of practice for timber framed walls. Buildings other than dwellings not exceeding four storeys (AMD Corrigendum 13630)*
Document History - Amendment 13630 is Corrigendum No.1

[BS 6446:1997](#) *Manufacture of glued structural components of timber and wood based panels*

Specifies manufacturing requirements for structural components (e.g. box beams, stressed skin panels, glued gussets, etc.) made from separate pieces of timber, plywood or tempered hardboard that are glued together.

[BS EN 386:2001](#) *Glued laminated timber - Performance requirements and minimum production requirements*

Document History - Supersedes BS EN 386:1995.

[BS EN 518:1995](#) *Structural timber - grading - requirements for visual strength grading standards (Superseded but remains current)*

Document History - Superseded by BS EN 14081-2:2005 but remains current

[BS EN 519:1995](#) *Structural timber - grading - requirements for machine strength graded timber and grading machines (Superseded but remains current)*

Document History - Partially supersedes BS 4978:1988. Superseded by BS EN 14081-2:2005 but remains current

[BS EN 1995-1.1:2004](#) *Eurocode 5: Design of timber structures. General - Common rules and rules for buildings (AMD Corrigendum 16499)*

Document History - Supersedes DD ENV 1995-1.1:1994. Amendment 16499 is Corrigendum No.1 dated July 2006.

Can be applied to the design of buildings and civil engineering works in timber (solid timber, sawn, planed or in pole form, glued laminated timber or wood-based structural products, e.g. LVL) or wood-based panels jointed together with adhesives or mechanical fasteners

[BS EN 1995-1.2:2004](#) *Eurocode 5: Design of timber structures. General - Structural fire design (AMD Corrigendum 16498)*

Document History - Supersedes DD ENV 1995-1.2:2000. Amendment 16498 is Corrigendum No.1 dated July 2006. To enable EN 1995-1-2 to be used in the UK, the NDPs will be published in a National Annex, which will be made available by BSI in due course, after public consultation has taken place.

Can be applied to the design of buildings and civil engineering works in timber (solid timber, sawn, planed or in pole form, glued laminated timber or wood-based structural products, e.g. LVL) or wood-based panels jointed together with adhesives or mechanical fasteners.

[BS EN 1995-2:2004](#) *Eurocode 5: Design of timber structures. Bridges*

Can be applied to the design of buildings and civil engineering works in timber (solid

timber, sawn, planed or in pole form, glued laminated timber or wood-based structural products, e.g. LVL) or wood-based panels jointed together with adhesives or mechanical fasteners.

[BS EN 14081-1:2005](#) *Timber structures - Strength graded structural timber with rectangular cross section. General requirements*

Document History - Supersedes BS EN 518:1995 and BS EN 519:1995. This is a candidate harmonized European Standard and fully takes into account the requirements of the European Commission mandate M 112, Structural timber products and ancillaries

Specifies the requirements for visual and machine graded structural timber with rectangular cross-sections shaped by sawing, planing or other methods.

[BS EN 14081-2:2005](#) *Timber structures - Strength graded structural timber with rectangular cross section. Machine grading, additional requirements for initial type testing*

Document History - Supersedes BS EN 518:1995 and BS EN 519:1995 which remains current. This is a candidate "harmonized" European Standard under the EU Construction Products Directive (89/106/EEC), and intended to lead to CE marking. For initial type testing of machine graded structural timber with rectangular cross-sections shaped by sawing, planing or other methods

[BS EN 14081-3:2005](#) *Timber structures - Strength graded structural timber with rectangular cross section. Machine grading, additional requirements for factory production control*

Document History - Supersedes BS EN 518:1995 and BS EN 519:1995 which remains current. This is a candidate "harmonized" European Standard under the EU Construction Products Directive (89/106/EEC), and intended to lead to CE marking. For factory production control of machine graded structural timber with rectangular cross-sections shaped by sawing, planing or other methods

[NA to BS EN 1995-2:2004](#) *UK National Annex to Eurocode 5: Design of timber structures. Bridges*

Gives the UK decisions for the Nationally Determined Parameters described in clauses 2.3.1.2(1), 2.4.1, 7.2 and 7.3.1(2) of BS EN 1995-2:2004.

Building Services Research and Information Association

[Interface Engineering Publication 5/2004](#) *Services in structural framed timber buildings*

Provides comprehensive advice on the interface issues of mechanical and electrical services with timber structures. Presents key design issues of structural timber frame, design issues for services and fire engineering. Includes case studies on Norwich Cathedral Refectory and Sheffield Winter Gardens.

[Interface Engineering Publication 6/2005](#) *Services in timber framed construction. Guidance to a defect-free interface*

Document History - Jointly researched, edited and produced by BSRIA and TRADA. Part-funded by the Department of Trade and Industry.

Intended to encourage best practice for the installation of mechanical and electrical

building services in timber framed construction. Also provides a clients' guide to timber framed construction in terms of key issues, notching and drilling, and fixing to timber-framed walls.

British Woodworking Federation

[Structural timberwork and what it can do for you](#)

This publication looks at the benefits of structural timberwork and the types of engineered components available and their applications.

[Guide 6 CDM and timber frame construction. 1998 revision](#)

Document History - First published - 1997

Review of the Construction (Design and Management) Regulations 1994 with respect to works carried out by BWF members.

Chartered Institute of Building

[Construction Papers 22 Developments in timber technology](#)

Council of Forest Industries

[Timber frame house construction : check it out](#)

As a further aid in achieving a defect free construction, Check It Out is provided as a checklist for site supervisors and inspectors. It relates specifically to the platform frame method of timber frame construction employing factory pre-fabricated wall components although this does not preclude the use of site constructed (stick-built) components employing the same basic principles.

[CLS Kiln dried spruce-pine-fir](#)

Gives dimensions, grades, stresses and spans for kiln-dried CLS Spruce-Pine-Fir (SPF).

[Timber frame building. Guide to platform frame construction](#)

This guide provides information and guidance on the correct application of the techniques and practices necessary to achieve a high degree of success in timber frame building.

[Canadian wood-frame house construction](#)

This publication explains in detail how a wood-frame house is put together in Canada. It presents the most commonly employed construction methods and provides suggestions for the selection of suitable materials.

Defence Estates

[Historic Buildings Factsheet T 2.01 Structure - timber: timber frames and roofs](#)

Document History - This set was formerly known as - Design and maintenance guides for historic buildings.

Identifies frame types and recent developments. Emphasises understanding structure, analysis, alterations and repair.

National House Building Council

[Standards Extra 33](#) *NHBC Technical newsletter - September 2005*

Includes articles on: main changes to concrete specifications and BRE Special Digest 1, a review of Robust Details' first year of operations and findings so far, guidance to ensure timber frame systems are properly certified, and current requirements on electrical safety according to Building Regulations Part P and their impact on building control procedures.

Nordic Timber Council

[Swedish and Finnish whitewood and redwood stress graded to BS 4978: 1988](#)

This publication explains the requirements of the standard as it relates to Swedish and Finnish whitewood and redwood.

[How to specify Swedish and Finnish redwood and whitewood](#)

This booklet is intended to be a guide for architects, engineers, quantity surveyors, designers, manufacturers, builders and buyers when specifying Swedish and Finnish Redwood and Whitewood for end uses.

[Swedish and Finnish redwood and whitewood performance in fire](#)

This publication sets out in sequence all necessary information for an architect or designer to specify Redwood and Whitewood for structural use in fire conditions.

[Principles of timber framed construction](#)

This booklet has been generally confined to the construction of timber framed houses built by the 'platform frame' method although most of the information is equally relevant to other types of construction. The information contained in this publication relates to houses and flats having no more than three storeys.

[Advisory Notes 1](#) *Timber framed houses: extensions and conversions*

These notes cover; qualified help, external walls, internal walls, and floors and roofs.

Society for the Protection of Ancient Buildings

[Information Sheet 3](#) *Surface treatment of timber-framed houses*

Looks at the treatment of exposed framing.

[Technical Pamphlet 11](#) *Panel infillings to timber-framed buildings*

This pamphlet deals with infill panels that form the walling between structural members in timber-framed building.

[Technical Pamphlet 12](#) *Repair of timber frames and roofs*

This pamphlet is intended to provide architects, builders and surveyors with some simple information about the type of repairs which the Society believes should be used when working on the repair of timber framed buildings and roofs.

TRADA Technology

[Hardwoods in construction](#)

Document History - Document reference number: TBL 62

This book concentrates on the technical aspects of the wide range of hardwoods commercially available and considers their properties in terms of simple classification schemes. It introduces aspects of wood technology which need to be understood before timber can be used successfully in construction.

[Timber pole construction: an introduction. 2nd edition](#)

This document gives a general introduction to timber poles as a construction material, and covers the processes of harvesting and protecting the poles through to specific applications in the construction of domestic and industrial buildings.

[Resin repairs to timber structures. Volume 1 - Guidance and selection](#)

Document History - Should be read in conjunction with - TRADA Resin repairs to timber structures. Volume 2

This guide provides a basis for the selection and execution of resin repairs to timber structures. It is intended to be a concentrated and concise guide to the specific topic of resin-bonded repair systems, principally those carried out using epoxy resins, together with metal rods, plates and similar forms of connectors and reinforcements.

[Timber frame construction. 3rd edition / Part 2 - Foundations. \(3 of 14\)](#)

Document History - This document is part of a larger document, Timber Frame Construction, which has been split into parts for ease of use.

This book covers all aspects of timber frame construction from foundations, ground floors and walls through to roofs, cladding and services. The book also gives details about materials data and supervisors checklists.

[Timber frame construction. 3rd edition / Part 3 - Ground floors. \(4 of 14\)](#)

Document History - This document is part of a larger document, Timber Frame Construction, which has been split into parts for ease of use.

This book covers all aspects of timber frame construction from foundations, ground floors and walls through to roofs, cladding and services. The book also gives details about materials data and supervisors checklists.

[Timber frame construction. 3rd edition / Part 4 - Walls. \(5 of 14\)](#)

Document History - This document is part of a larger document, Timber Frame Construction, which has been split into parts for ease of use.

This book covers all aspects of timber frame construction from foundations, ground floors and walls through to roofs, cladding and services. The book also gives details about materials data and supervisors checklists.

[Timber frame construction. 3rd edition / Part 5 - Party walls. \(6 of 14\)](#)

Document History - This document is part of a larger document, Timber Frame Construction, which has been split into parts for ease of use.

This book covers all aspects of timber frame construction from foundations, ground floors and walls through to roofs, cladding and services. The book also gives details about materials data and supervisors checklists.

[Timber frame construction. 3rd edition / Part 6 - Intermediate floors. \(7 of 14\)](#)

Document History - This document is part of a larger document, Timber Frame

Construction, which has been split into parts for ease of use.

This book covers all aspects of timber frame construction from foundations, ground floors and walls through to roofs, cladding and services. The book also gives details about materials data and supervisors checklists.

[Timber frame construction. 3rd edition / Part 7 - Party floors. \(8 of 14\)](#)

Document History - This document is part of a larger document, Timber Frame Construction, which has been split into parts for ease of use.

This book covers all aspects of timber frame construction from foundations, ground floors and walls through to roofs, cladding and services. The book also gives details about materials data and supervisors checklists.

[Timber frame construction. 3rd edition / Part 8 - Roofs. \(9 of 14\)](#)

Document History - This document is part of a larger document, Timber Frame Construction, which has been split into parts for ease of use.

This book covers all aspects of timber frame construction from foundations, ground floors and walls through to roofs, cladding and services. The book also gives details about materials data and supervisors checklists.

[Timber frame construction. 3rd edition / Part 9 - Cladding. \(10 of 14\)](#)

Document History - This document is part of a larger document, Timber Frame Construction, which has been split into parts for ease of use.

This book covers all aspects of timber frame construction from foundations, ground floors and walls through to roofs, cladding and services. The book also gives details about materials data and supervisors checklists.

[Timber frame construction. 3rd edition / Part 10 - Services. \(11 of 14\)](#)

Document History - This document is part of a larger document, Timber Frame Construction, which has been split into parts for ease of use.

This book covers all aspects of timber frame construction from foundations, ground floors and walls through to roofs, cladding and services. The book also gives details about materials data and supervisors checklists.

[Timber frame construction. 3rd edition / Part 11 - Advertisement section. \(12 of 14\)](#)

Document History - This document is part of a larger document, Timber Frame Construction, which has been split into parts for ease of use.

This book covers all aspects of timber frame construction from foundations, ground floors and walls through to roofs, cladding and services. The book also gives details about materials data and supervisors checklists.

[Timber frame construction. 3rd edition / Part 12 - Appendices. \(13 of 14\)](#)

Document History - This document is part of a larger document, Timber Frame Construction, which has been split into parts for ease of use.

This book covers all aspects of timber frame construction from foundations, ground floors and walls through to roofs, cladding and services. The book also gives details about materials data and supervisors checklists.

[Timber frame construction. 3rd edition / Part 13 - References and index. \(14 of 14\)](#)

Document History - This document is part of a larger document, Timber Frame Construction, which has been split into parts for ease of use.

This book covers all aspects of timber frame construction from foundations, ground floors and walls through to roofs, cladding and services. The book also gives details about materials data and supervisors checklists.

[*Timber frame construction. 3rd edition / Part 0 - Contents and introduction. \(1 of 14\)*](#)

Document History - This document is part of a larger document, Timber Frame Construction, which has been split into parts for ease of use.

This book covers all aspects of timber frame construction from foundations, ground floors and walls through to roofs, cladding and services. The book also gives details about materials data and supervisors checklists.

[*Timber frame construction. 3rd edition / Part 1 - Timber Frame Construction: an overview. \(2 of 14\)*](#)

Document History - This document is part of a larger document, Timber Frame Construction, which has been split into parts for ease of use.

This book covers all aspects of timber frame construction from foundations, ground floors and walls through to roofs, cladding and services. The book also gives details about materials data and supervisors checklists.

[*Timber frame housing: UK structural recommendations*](#)

Document History - Supersedes the 1989 edition.

Covers well-established principles and methods for the structural design, strength and stability checking of timber frame buildings. Worked examples, including calculations for a complete house, are included. Guidance is based on the recommendations in BS 5268-2 and BS 5268-6 and also includes procedures now widely used in the design of timber frame houses from outside of these codes.

[*Resin repairs to timber structures. Volume 2 - Design examples to Eurocode 5. Design examples R1-R3*](#)

Document History - Should be read in conjunction with - TRADA Resin repairs to timber structures. Volume 1

Volume 2 includes calculated and annotated Design Examples for three typical repair types; tension members, beam end repairs and eaves joint repair.

[*Site guidance: timber frame houses*](#)

This information sheet is confined to on-site guidance and does not include manufacture, design or contract information, nor site information, but includes a diagram for building sequence.

[*Energy efficient housing: a timber frame approach*](#)

Document History - Document reference number: TBL 61

Covers the principles of energy efficient design and planning, the building envelope, ventilation and infiltration, fuels and services, solar heating and condensation control.

[*Timber in construction / Chapter 0 - Contents and introduction. \(1 of 15\)*](#)

Document History - This is the 1987 reprint. This document is part of a larger document, Timber in Construction, which has been split into parts for ease of use.

This book has been prepared by the Timber Research and Development Association as part of its 50th anniversary celebrations. There has long been a need for an authoritative reference book on the use of timbers in construction for architects and

specifiers and for students in these fields. This book, with each chapter written by a specialist in the subject, is intended to fill that gap.

[*Timber in construction / Chapter 2 - Panel products. \(3 of 15\)*](#)

Document History - This is the 1987 reprint. This document is part of a larger document, Timber in Construction, which has been split into parts for ease of use. This book has been prepared by the Timber Research and Development Association as part of its 50th anniversary celebrations. There has long been a need for an authoritative reference book on the use of timbers in construction for architects and specifiers and for students in these fields. This book, with each chapter written by a specialist in the subject, is intended to fill that gap.

[*Timber in construction / Chapter 5 - Historic development of timber structures. \(6 of 15\)*](#)

Document History - This is the 1987 reprint. This document is part of a larger document, Timber in Construction, which has been split into parts for ease of use. This book has been prepared by the Timber Research and Development Association as part of its 50th anniversary celebrations. There has long been a need for an authoritative reference book on the use of timbers in construction for architects and specifiers and for students in these fields. This book, with each chapter written by a specialist in the subject, is intended to fill that gap.

[*Timber in construction / Chapter 6 - Development of modern timber structures. \(7 of 15\)*](#)

Document History - This is the 1987 reprint. This document is part of a larger document, Timber in Construction, which has been split into parts for ease of use. This book has been prepared by the Timber Research and Development Association as part of its 50th anniversary celebrations. There has long been a need for an authoritative reference book on the use of timbers in construction for architects and specifiers and for students in these fields. This book, with each chapter written by a specialist in the subject, is intended to fill that gap.

[*Timber in construction / Chapter 7 - Timber frame construction. \(8 of 15\)*](#)

Document History - This is the 1987 reprint. This document is part of a larger document, Timber in Construction, which has been split into parts for ease of use. This book has been prepared by the Timber Research and Development Association as part of its 50th anniversary celebrations. There has long been a need for an authoritative reference book on the use of timbers in construction for architects and specifiers and for students in these fields. This book, with each chapter written by a specialist in the subject, is intended to fill that gap.

[*Timber in construction / Chapter 8 - Domestic carpentry. \(9 of 15\)*](#)

Document History - This is the 1987 reprint. This document is part of a larger document, Timber in Construction, which has been split into parts for ease of use. This book has been prepared by the Timber Research and Development Association as part of its 50th anniversary celebrations. There has long been a need for an authoritative reference book on the use of timbers in construction for architects and specifiers and for students in these fields. This book, with each chapter written by a specialist in the subject, is intended to fill that gap.

[Timber in construction / Chapter 12 - Timber, decorative and practical. \(13 of 15\)](#)

Document History - This is the 1987 reprint. This document is part of a larger document, Timber in Construction, which has been split into parts for ease of use. This book has been prepared by the Timber Research and Development Association as part of its 50th anniversary celebrations. There has long been a need for an authoritative reference book on the use of timbers in construction for architects and specifiers and for students in these fields. This book, with each chapter written by a specialist in the subject, is intended to fill that gap.

[Timber in construction / Chapter 13 - Timber today and tomorrow. \(14 of 15\)](#)

Document History - This is the 1987 reprint. This document is part of a larger document, Timber in Construction, which has been split into parts for ease of use. This book has been prepared by the Timber Research and Development Association as part of its 50th anniversary celebrations. There has long been a need for an authoritative reference book on the use of timbers in construction for architects and specifiers and for students in these fields. This book, with each chapter written by a specialist in the subject, is intended to fill that gap.

[Timber in construction / Chapter 14 - Appendix and references. \(15 of 15\)](#)

Document History - This is the 1987 reprint. This document is part of a larger document, Timber in Construction, which has been split into parts for ease of use. This book has been prepared by the Timber Research and Development Association as part of its 50th anniversary celebrations. There has long been a need for an authoritative reference book on the use of timbers in construction for architects and specifiers and for students in these fields. This book, with each chapter written by a specialist in the subject, is intended to fill that gap.

[Eurocode design guidance - introduction 1998](#)

[Design Aid 1 Design examples to BS 5268: part 2 1984](#)

The objective of this publication is to illustrate the use of BS 5268 Part 2: 1984 by means of worked examples which act as pointers to the different tables and clauses from which design figures are obtained.

[Design Aid 4 Load tables for nailed ply-box beams to BS 5268](#)

This report complements TRADA publication DA 5/84 'Load tables for glued ply-box beams', which provides for beams of glued construction in similar types of timber and plywood. Both publications give load tables for beams having flanges of strength classes SC2 to SC5, catering mainly for softwoods stress graded to the GS and SS grades of BS 4978: 1973, and for beams having keruing flanges stress graded to the HS grade of BS 5756: 1980.

[Design Aid 5 Load tables for glued ply-box beams to BS 5268](#)

This report complements TRADA publication DA 4/84 'Load tables for nailed ply-box beams', which provides for beams of nailed construction in similar types of timber and plywood. Both publications give load tables for beams having flanges of strength classes SC2 to SC5, catering mainly for softwoods stress graded to the GS and SS grades of BS 4978: 1973, and for beams having keruing flanges stress graded to the HS grade of BS 5756: 1980.

[*Design Aid 8 Design of a solid timber portal with nailed plywood gussets*](#)

The ply-gusseted portal is the basis of a simple and economical method for the construction of public halls, schools, factories, warehouses and agricultural buildings, in which fairly large open floor area is required. This design aid provides assistance in the design of such buildings to engineers, designers and architects.

[*Design Guide 1 Structural timber composites*](#)

This publication covers; structural timber composites; the materials; and designing with structural timber composites.

[*Eurocode 5 Guidance Document 1 Introduction to Eurocode 5: design of timber structures*](#)

This guidance document outlines the purpose, nature and contents of the new European structural timber design code; Eurocode 5, BS DD-ENV-1995 Part 1.1 1994. It summarizes the likely advantages and disadvantages of using Eurocode 5 instead of BS 5268 Part 2, and describes the help that will be provided for those who decide to use the new code during its trial period.

[*Eurocode 5 Guidance Document 2 How to calculate design values for loads using Eurocode 5*](#)

This paper explains how to calculate the design values of loads for both ultimate and serviceability limit states.

[*Eurocode 5 Guidance Document 3 How to calculate design values of material properties using Eurocode 5*](#)

This guidance document explains how to calculate the design values of material properties for solid timber, glulam, wood-based panel products and metal fasteners.

[*Guidance Document GD 2 How to calculate the design values of loads using Eurocodes. 2nd Edition*](#)

Explains how to calculate the design values of loads and addresses both ultimate limit states and serviceability limit states. For timber structures, the most relevant parts of the structural Eurocode programme are Eurocodes 0, 1 and 5.

[*Guidance Document GD 5 How to calculate deformations in timber structures using Eurocodes. 2nd Edition*](#)

Document History - Supersedes TRADA Guidance Documents GD4 How to calculate deformations using Eurocode 5 and GD5 How to calculate deformations in timber structures using Eurocode 1

Describes the principles and application of serviceability limit state (SLS) design to structural timber members, assemblies and built-up components, as set out in Eurocode 0, BS EN 1990:2002 Eurocode - Basis of structural design. Explains the timber-specific rules relating to creep, joint slip and deflection limits as detailed in BS EN 1995-1-1: 2004 Eurocode 5. Design of timber structures. General. Common rules and rules for buildings.

[*Guidance Document GD 7 Multiple fastener timber joints: guidance on BS 5268-2 and Eurocode 5. \(January 2003 revision\)*](#)

Document History - Revised January 2003

Document explains the factors which affect the strength of multiple fastener joints and

describes relevant research in this field. Provides new design recommendations for both BS 5268-2 and Eurocode 5.

[Report 1/99](#) *Medium rise timber frame: a best practice benchmarking guide*

Defines benchmarks for current practice in medium-rise timber frame construction, sets 'stretch targets' and includes details of the performance levels achieved in the construction of TF 2000 - a demonstration 6 storey timber frame building.

[Technology Report 1/2000](#) *Acoustic performance of party floors and walls in timber framed buildings*

Document History - Alternative series title Research Report 1/2000

This report includes detail designs, specification and test results for 11 floors which met an enhanced target level and 6 floors which met enhanced + level.

[Technology Report 2/2000](#) *Timber frame: re-engineering for affordable housing*

Document History - Alternative series title Research Report 2/2000

This document is aimed at affordable housing providers whether in the social and/or the private sector.

[Technology Report 2/2003](#) *UK timber supply chain: improving management and reducing environmental impact*

Demonstrates how the environmental impact of the storage and distribution of wood products can be minimised through better supply chain management.

[Wood Information Sheet 0/ 1](#) *Timber in swimming pool hall construction*

This WIS provides guidance of the design of swimming pool halls using timber, with regard to minimising the risk of damage from water and/or condensation.

[Wood Information Sheet 0/ 3](#) *Introduction to timber framed construction*

Document History - Revises 1999 edition

This publication covers method of construction, external and internal walls, party walls, other structural elements, services and preservative treatment.

[Wood Information Sheet 0/ 5](#) *Timber frame building: materials specification (May 2006 revision)*

Document History - Supersedes 2003 edition.

Outlines the materials normally specified for typical timber frame building, although some variation will occur according to the structural design and detailing requirements of specific projects. Many components, such as cladding materials and joinery, are not specific to timber frame and are therefore not covered in detail here.

[Wood Information Sheet 0/ 8](#) *Timber frame construction - site control*

Document History - Supersedes 2001 edition

Concentrates on the most important aspects of assembly of the frame and the ancillary operations involved in completing the superstructure. Does not include timber frame design and detailing. Covers concrete base and foundation walls, sole plates, delivery of components, erecting timber frame, site work on wall panels, and external cladding.

[Wood Information Sheet 0/10](#) *Surveys of timber framed houses (April 2006 revision)*

Document History - Supersedes 1992 edition.

Offers guidance for building surveyors and professionals in the construction industry who may need to survey timber framed houses. It is not concerned with surveying traditional large-section timber framed structures; it concentrates on details where timber frame construction differs enough from masonry to suggest specific checks.

[Wood Information Sheet 0/11](#) *Improving the thermal performance of existing timber frame buildings*

This document covers; wall insulation; upgrading windows; draught sealing; floor insulation and; increasing roof insulation;

[Wood Information Sheet 1/6](#) *Glued laminated timber (January 2003 edition)*

Aesthetically attractive structural timber components of large sizes and complex shapes can be fabricated from smaller sawn sections (laminates) by the process of glued lamination, known as glulam.

[Wood Information Sheet 1/17](#) *Structural use of hardwoods (February 2003 revision)*

Document History - Revised February 2003

This document covers; the types of hardwoods available; strength grading and strength classes; design to BS 5268 Pt 2 and; design to Eurocode 5.

[Wood Information Sheet 1/34](#) *Assessment and repair of structural timber*

This document covers; the need for repair; survey and assessment; the survey; the assessment and; repair methods.

[Wood Information Sheet 1/37](#) *Eurocode 5: an introduction (June 2006 revision)*

Document History - Supersedes the 2000 revision.

Provides a general introduction to EC5-1.1 and outlines the major differences between it and BS 5268-2.

[Wood Information Sheet 1/46](#) *Decorative timber flooring*

Gives guidance to designers and specifiers on aspects which must be considered when choosing a timber floor. It deals mainly with decorative floors in dwellings, offices and institutional buildings and does not specifically address the detailed requirements of gymnasias, sports halls, dance floors or other special floors.

[Wood Information Sheet 2.3/31](#) *Adhesively-bonded timber connections - adhesives and timber construction (June 2003 revision)*

Document History - Supersedes 1992 version

This information sheet is concerned only with the use of adhesives in structural joints.

[Wood Information Sheet 2.3/36](#) *Design of structural timber connections*

Document History - This document is the May 2003 revision

Joints are an essential part of any structure and in timber structures they are often the most critical parts in design. It is not uncommon for the timber sections sizes in a structure to be determined by the joints, rather than their load carrying capacity. Therefore the design of joints is an important section of any design code, and particularly so for timber.

[Wood Information Sheet 4/15](#) *Condensation control in dwellings*

This information sheet looks at why condensation occurs and ways of reducing it.

[Wood Information Sheet 4/22](#) *Resin-bonded repair systems for structural timber*

Document History - Supersedes 1995 edition

Provides an overview of the ways in which epoxy resins are currently used in repair work and gives surveyors, designers and owners or keepers of structures some guidance as to the suitability of resin repair techniques. Covers uses, conditions of use, applications, structural action and typical repair situations.

[Wood Information Sheet 4/23](#) *Non-destructive testing of timber (2004 revision)*

Provides an introduction to non-destructive testing of timber in buildings and other structures for architects, engineers, surveyors and building inspectors. The various NDT techniques are discussed, together with their capabilities and limitations. Potential future developments are outlined.

[Wood Information Sheet 4/24](#) *Serviceability limit states for timber in buildings (February 2000 revision)*

This information sheet explains the fundamentals of serviceability limit states design in timber structures, providing and defining a number of essential terms and concepts.

[Wood Information Sheet 4/29](#) *Dry-graded structural softwood*

Considers importance of dry-graded softwood and discusses standards governing strength grading. Covers visual grading, sizes and processing, quality assurance and certification, how strength-graded timber is used, factors affecting strength, and availability.

Timber frame, linings

BRE

[Digest 494](#) *Using UK grown Douglas fir and larch timber for external cladding*

Discusses the potential for two UK-grown species, Douglas fir and larch. These timbers have been benchmarked against western red cedar to determine their comparative properties as external cladding timbers during a 2-year BRE project.

TRADA Technology

[Wood Information Sheet 1/35](#) *Breather membranes for timber frame walls*

Document History - Supersedes 1992 edition

All timber frame walls are designed to 'breathe'. The term breathe refers to the ability of a wall to allow water vapour to diffuse through the structure from the inside of the building to the outside. To ensure that water cannot condense within the wall structure. Covers rules of thumb, performance requirements, applications and installation of breather membranes for timber frame walls.

Timber external walls

Architects' Journal

[Architects' Journal Technical](#) *All timber walls breathe. AJ 15.10.98*

The article explains, with examples, the simple concept of the breathing wall, and how this is often wrongly, or confusingly linked to only certain wall constructions

Engineered Wood Association

[Diaphragms and shear walls](#)

Buildings can be designed to resist the horizontal loads introduced by the most violent wind or earthquake through the application of a principle called diaphragm design. This guide defines diaphragms and shear walls and gives examples of how they can be incorporated into building design.

[Residential and commercial](#)

This guide is designed as a handy reference manual for panel specifiers and users in both residential and commercial/industrial construction. It contains up-to-date information on panel grades, including APA Performance Rated Panels, specification practices, floor, wall and roof systems, diaphragms and shear walls, fire-rated systems and methods of finishing.

Building Research Energy Conservation Support Unit

[Good Practice Guide 6](#) *Energy efficiency in new housing: timber framed external walls*

Timber floors

Architects' Journal

[Architects' Journal Timber in Construction](#) *Floor structures. AJ 17.7.91*

Engineered Wood Association

[Noise-rated systems](#)

This booklet gives basic information on the types, measurement and control of noise, the results of acoustical tests on various plywood construction systems, and a report on field construction versus laboratory tests.

[Residential and commercial](#)

This guide is designed as a handy reference manual for panel specifiers and users in both residential and commercial/industrial construction. It contains up-to-date information on panel grades, including APA Performance Rated Panels, specification practices, floor, wall and roof systems, diaphragms and shear walls, fire-rated systems and methods of finishing.

[APA rated Sturd-I-Floor. Performance-rated floor panel](#)

This document concerns APA Rated Sturd-I-Floor, which is a single-layer wooden floor panel engineered and manufactured to meet the specific performance requirements of a floor deck, including strength, stiffness, dimensional stability and performance under concentrated static and impact loads.

Association for Specialist Fire Protection

[Fire protection of timber floors](#)

Details the principles and main factors influencing fire resistance performance of timber floors.

Aurum Press Limited

[Georgian house / Part 15 - Floors. \(16 of 25\)](#)

Document History - This document is part of a larger document, the Georgian House, which has been split into parts for ease of use.

Designed to instruct in the techniques of Georgian building. Covers types of Georgian houses such as British and American, with examples of styles. Also covers building techniques in brick and stonework, render, weatherboarding, windows, roofs, ironwork, mouldings, floors and stairs, internal decoration, soft furnishings and lighting.

British Board of Agreement

[Information Sheet 12](#) *Chipboard flooring in dwellings - survey of behaviour in use*

BRE

[Defect Action Sheet 31](#) *Suspended timber floors: chipboard flooring - specification*

[Defect Action Sheet 32](#) *Suspended timber floors: chipboard flooring - storage and installation*

[Defect Action Sheet 45](#) *Intermediate timber floors in converted dwellings - sound insulation*

[Defect Action Sheet 73](#) *Suspended timber ground floor: remedying dampness due to inadequate ventilation*

[Defect Action Sheet 74](#) *Suspended timber ground floor: repairing rotted joists*

[Defect Action Sheet 99](#) *Suspended timber floors: notching and drilling of joists*

Document History - Replaces- BRE Defect Action Sheet 47

[Defect Action Sheet 103](#) *Wood floors: reducing risk of recurrent dry rot*

[Digest 208](#) *Increasing the fire resistance of existing timber floors*

Where there is an alteration, extension or material change of use of a building, the period of fire resistance of existing timber floors may need to be increased. This digest explains how periods of up to one hour may be achieved. It discusses the addition of protection to the underside of the ceiling, over the floor boarding and between the joists, and the problems of improving fire resistance when the joists are exposed to view from below.

[Digest 364](#) *Design of timber floors to prevent decay*

Document History - Replaces - BRE Digest 18

Timber is an organic material which, under damp conditions, may be at risk of decay by wood rotting fungi. Different timber species have different ° of natural resistance to fungal decay but the softwood species most commonly used in modern building construction all have a low natural resistance to decay. It is important, therefore, that the moisture content in service remains below the critical threshold for decay. To be immune from attack, the moisture content of timber must be maintained below about 22 per cent. Occasional, brief periods of superficial wetting, due say to condensation, are unlikely to allow initiation of decay. This threshold value applies to decay by the dry rot fungus *Serpula lacrymans* as well as the wet rot types of decay which result from attack by a number of other fungi.

[Good Building Guide 28 Part 3](#) *Domestic floors: assessing them for replacement or repair - timber floors and decks*

This guide tells you how to inspect the condition of timber floors and decks and how to assess them for repair or replacement. It deals with the most common forms of deterioration and includes checklists to help you inspect a floor. It is mostly about domestic floors but some recommendations apply also to other types of building. This guide is of interest to designers, building surveyors and builders.

[Good Building Guide 28 Part 5](#) *Domestic floors: repairing or replacing floors and flooring - wood blocks and suspended timber*

The Building Research Establishment receives many enquiries about repairs to floors and floorings. This guide describes some of the common ones. It is concerned mainly with domestic buildings but some recommendations are equally applicable to other types of building. This guide is of interest to designers, building surveyors and builders.

[Information Paper 5/81](#) *Field measurements of the sound insulation of timber-joist party floors*

[Technical Note 12](#) *Flooring and joinery in new buildings: how to minimise dimensional changes*

British Standards Institution

[BS 1297:1987](#) *Specification for tongued and grooved softwood flooring*

Document History - Supersedes BS 1297:1970

Range of species, characteristics, manufacturing and moisture content requirements.

[BS 5268-4.2:1990](#) *Structural use of timber. Fire resistance of timber structures. Recommendations for calculating fire resistance of timber stud walls and joisted floor constructions*

Document History - Confirmed April 2002

Extends the code given in Section 4.1 of BS 5268 to include composite timber elements.

[BS 5268-7.1:1989](#) *Structural use of timber. Recommendations for the calculation basis for span tables. Domestic floor joists*

Document History - Confirmed April 2002

Permissible clear spans for simply supported joists of solid timber at maximum spacing of 610 mm. Only uniform loading is considered.

[BS 8103-3:1996](#) *Structural design of low-rise buildings. Code of practice for timber floors and roofs for housing*

This part of BS 8103 gives recommendations for the sizes of timber elements, fixings, and their connections with masonry walls etc. It applies to detached, semi-detached, terraced houses and flats of not more than three storeys above ground, intended for domestic occupation.

[BS 8201:1987](#) *Code of practice for flooring of timber, timber products and wood based panel products*

Recommendations for laying wood board and strip, block, mosaic, overlay and parquet, and wood based panel products.

Council of Forest Industries

[Canadian COFI Exterior plywood for heavy-duty floors](#)

This publication provides details on COFI exterior plywood for heavy-duty floors.

[Timber suspended ground floors](#)

This publication provides details on timber suspended ground floors.

[COFI timber compartment floor guide](#)

This publication provides details on COFI timber compartment floor guide.

Defence Estates

[Historic Buildings Factsheet T 2.02 Structure - timber floors](#)

Document History - This set was formerly known as - Design and maintenance guides for historic buildings.

Considers calculating floor loadings, repairs of members under different stresses, and resin repairs.

Housing Association Property Mutual Ltd

[Technical Note 11 Particleboard floor decking](#)

Premature failures in particleboard decking have prompted changes to the HAPM insured lives for flooring in damp locations. This note alerts members to the potential risks and explains how costly failures can be avoided in practice.

National House Building Council

[Standards Extra 26 NHBC Technical newsletter - April 2003](#)

Includes articles on building near trees, concrete and its reinforcement, underfloor heating systems, changes to Part E of the building regulations and floor joist support.

Nordic Timber Council

[Domestic floor joists load sharing systems](#)

Contains load/span tables for joists of Swedish and Finnish Redwood and Whitewood.

[Non-domestic floor joists load sharing systems](#)

Contains load/span tables for joists of Swedish and Finnish Redwood and Whitewood.

[Joists for permanent storage load sharing systems](#)

Contains load/span tables for joists of Swedish and Finnish Redwood and Whitewood.

Society for the Protection of Ancient Buildings

[Information Sheet 10 Patching old floorboards](#)

This information sheet suggests a number of ways in which old boards may be patched or repaired. It is written with butt-edged boards in mind and the advice given will not necessarily be suitable for tongued and grooved boards.

[Technical Pamphlet 2 Strengthening timber floors](#)

This pamphlet suggests ways in which faulty beams can be made capable of performing their proper function with the minimum of disturbance and leaving practically no trace of the work that has been done.

TRADA Technology

[Timber decking manual](#)

This book provides best practice design and practical guidance to ensure that the desired longevity and performance is achieved in practice. Issues covered include; choosing and planning a deck, statutory requirements and standards, performance requirements, structural and detail design and specification, material selection and treatments, construction on site and maintenance guidance.

[Building regulations 1991: approved document: timber intermediate floors for dwellings \(excluding compartment floors\). Reprint \(including 1996 Amendment\)](#)

This guidance covers; structure; fire spread; conservation of fuel and power; sound insulation to floors of WC compartments; and installing services.

[Timber frame construction. 3rd edition / Part 6 - Intermediate floors. \(7 of 14\)](#)

Document History - This document is part of a larger document, Timber Frame Construction, which has been split into parts for ease of use.

This book covers all aspects of timber frame construction from foundations, ground floors and walls through to roofs, cladding and services. The book also gives details about materials data and supervisors checklists.

[Timber frame construction. 3rd edition / Part 7 - Party floors. \(8 of 14\)](#)

Document History - This document is part of a larger document, Timber Frame Construction, which has been split into parts for ease of use.

This book covers all aspects of timber frame construction from foundations, ground floors and walls through to roofs, cladding and services. The book also gives details about materials data and supervisors checklists.

[*Design Aid 3 Span tables for floor joists to BS 5268: Part 2: 1984*](#)

The aim of this publication is to provide information on span tables for floor joists to BS 5268: Part 2: 1984.

[*Design Aid 6 Joist span tables for domestic floors and roofs to BS 5268*](#)

This publication contains span tables for joists of timber in strength classes SC3, SC4 and SC5 introduced in BS 5268: Part 2: 1984.

[*Timber Engineering Guidance Document GD 6 Vibration in timber floors*](#)

Addresses the design of timber floors under the vibration aspects of serviceability Limit State design in DD ENV 1995-1.1, Eurocode 5. Explains the basis of the dynamic methods presented and draws upon research findings.

[*Technology Report 3/99 Timber floors: improvements through process re-engineering*](#)
Document History - Alternative series title Research Report 3/99

This publication is divided into the following sections; the need for process re-engineering of structural timber floors; application of process re-engineering principles to timber floors; technical benefits; cost benefits; current best practice and; technical validation of floor performance.

[*Technology Report 1/2000 Acoustic performance of party floors and walls in timber framed buildings*](#)

Document History - Alternative series title Research Report 1/2000

This report includes detail designs, specification and test results for 11 floors which met an enhanced target level and 6 floors which met enhanced + level.

[*Technology Report 2/2001 Sealing timber floors: a best practice guide*](#)

Guide to floor preparation and the selection, application and maintenance of floor lacquers. Covers types of seals, specifications, common faults and their prevention, preventative methods and refurbishment.

[*Technology Report 2/2002 Sealing timber floors: a specification guide*](#)

Provides objective guidance to consumers on the choice of commercially available seals for timber floors, based on comparative performance studies of thirty commercially available seal products.

[*Wood Information Sheet 1/36 Timber joist and deck floors - avoiding movement*](#)

Timber floors are easy to install, light in weight and have the advantage of utilising a material which is environmentally friendly, both in terms of a renewable resource and using little energy in its production or use. This WI Sheet gives guidance specifically intended to minimise problems of movement and noise in timber floors in masonry or timber frame buildings. The guidance relates principally to dwellings although much is applicable to floors in other building types, e. g. timber compartment floors in flats.

[*Wood Information Sheet 1/41 Strutting in timber floors \(2005 revision\)*](#)

Document History - Replaces - WIS 1/41 (1998)

Summarizes the findings of recent research and offers guidance on the provision of strutting in domestic and non-domestic floors.

Timber windows

Architects' Journal

[Building with timber. AJ 14.07.93](#)

[Architects' Journal Building Study](#) *Wild at heart. Wetlands Conservation Centre, Slimbridge, Gloucestershire. AJ 24.02.2000*

Refurbishment and new build project for the Wetlands Conservation Centre, Slimbridge, Gloucestershire. The timber-clad buildings house offices, visitor centre, shop and restaurant. Environmentally-friendly features include recycling of rainwater, natural ventilation, use of daylight and energy efficient design. Includes working details of timber windows in a ventilated cedar rainscreen wall. Gives costs breakdown. Architects: ECD Architects. Building Services and structural engineers: Whitby Bird and Partners

BRE

[Defect Action Sheet 11](#) *Wood windows and door frames: care on site during storage and installation*

[Defect Action Sheet 13](#) *Wood windows: arresting decay*

[Defect Action Sheet 14](#) *Wood windows: preventing decay*

[Good Repair Guide 10 Part 1](#) *Repairing timber windows: investigating defects and dealing with water leakage*

Defects occur in timber windows for a number of reasons including poor design, poor installation or glazing or lack of maintenance. One of the advantages of timber windows is that they can often be repaired without specialist skills, materials or knowledge. This Guide gives advice on how to investigate the fault and what to do about water leakage.

[Good Repair Guide 10 Part 2](#) *Repairing timber windows: dealing with draughty windows, condensation in sealed units, operating problems, and deterioration of frames*

This Guide gives advice on dealing with draughty windows, condensation between the panes of sealed units, windows that are difficult to operate, deterioration of external finishes, and distortion and decay of the frame.

[Information Paper 21/81](#) *In situ treatment for existing window joinery*

[Information Paper 20/82](#) *Effect of water-repellent preservative treatment on moisture levels in window joinery*

[Technical Note 28](#) *Maintenance and repair of window joinery*

[Technical Note 29](#) *Ensuring good service life for window joinery*

British Standards Institution

[BS 644:2003](#) *Timber windows - Factory assembled windows of various types - Specification*

Document History - Supersedes BS 644-1:1989, BS 644-2:1958 and BS 644-3:1951
Requirements are given for types, materials, profile design, workmanship, glazing, construction, safety, security, weathertightness performance, and operation and strength performance of factory assembled timber windows.

British Woodworking Federation

[Installing timber windows](#)

Guidance on glazing methods and practices preferred by the BWF. Covers: forming openings, fitting, support, fixing, sealing and decoration.

[Double hung sash windows](#)

Provides guidance on the design of double hung sash windows - covering requirements for materials, workmanship, dimensions and construction.

[Industry standard: double hung sash windows](#)

This publication covers; materials, workmanship, dimensions and construction (cased frames, solid frames, sashes, and slide and tilt sashes).

[Guide to specifying wood windows](#)

This guide covers; window types, appearance, general performance, thermal and acoustic performance, durability, installation, site practice, and specification methods.

British Wood Preserving and Damp Proofing Association

[Timber 4](#) *Preservation of window joinery*

English Heritage

[Framing opinions 4: Timber sash windows](#)

This publication is divided into four main sections; the origins of timber sash windows; timber quality; repair and rehabilitation; and the surveying and assessment of timber windows.

Guild of Architectural Ironmongers

[Technical Manual 1.8](#) *Timber, joinery, doors and frames*

Document History - Supersedes - Timber, joinery, doors and window construction, 1998

This manual sets out the door types generally in use and provides details of the materials used and their construction.

Glass and Glazing Federation

[Glazing Manual Data Sheet 5.10](#) *Design, installation and performance of secondary sashes made of aluminium, uPVC or wood*

This document deals with secondary sashes fitted to the room side of primary windows and which have frames made from aluminium, uPVC or wood or a

combination of these materials. It includes all forms with opening and/or fixed panels containing glass or plastics sheet glazing materials.

Housing Association Property Mutual Ltd

[Technical Note 12](#) *Insulating glass units in timber windows*

The frequency of problems with insulating glass units in fully bedded timber window frames has prompted this HAPM technical note. It highlights the most common problems in HAPMs experience, explains failures and describes the most reliable options.

Nordic Timber Council

[Design principles of weather sealed timber windows](#)

The scope of this publication is limited to; weathersealed windows, top or side hung, opening outwards, glazed from the outside, manufactured from Redwood or Whitewood.

Society for the Protection of Ancient Buildings

[Technical Pamphlet 13](#) *Repair of wood windows*

This pamphlet aims to demonstrate that limited decay can be tackled without total destruction, and that repair methods are to hand (both for the experienced joiner and the DIY enthusiast) which enable a decayed window to be brought back into a sound, functioning condition.

TRADA Technology

[High performance wood windows. 2nd edition](#)

Document History - 1st edition published as - Wood windows - design, selection and installation. Document reference number: TBL 65.

Guide which is primarily aimed at establishing principles of good practice in the design of wood windows in the UK. These principles are intended to aid architects in designing specific windows for projects, or in the selection of suitable commercially available standard windows for their buildings.

Timber doors

Architects' Journal

[Building with timber. AJ 14.07.93](#)

[AJ Focus](#) *Doors, grills and shutters. AJ Focus 11.90*

[AJ Focus](#) *Doors. AJ Focus 1.92*

BRE

[Defect Action Sheet 11](#) *Wood windows and door frames: care on site during storage and installation*

[Defect Action Sheet 87](#) *Wood entrance doors: discouraging illegal entry - specification*

[Digest 476](#) *Guide to machine strength grading of timber*

Machine strength grading of timber has been used commercially for at least 30 years, but, for many people involved with the process, it has remained a specialised subject. Without knowing the theory and practice of grading, misunderstandings are likely to arise. The main aim of this Digest is to improve knowledge of the process of machine strength grading and to highlight the benefits.

[Information Paper 8/82](#) *Increasing the fire resistance of existing timber doors*

British Standards Institution

[BS 459:1988](#) *Specification for matchboarded wooden door leaves for external use (AMD 8737)*

Document History - Confirmed October 2005

Size limitations, materials, workmanship and construction for ledged and braced doors, framed and ledged doors and framed, ledged and braced doors for external use.

[BS 4787-1:1980](#) *Internal and external wood doorsets, door leaves and frames. Specification for dimensional requirements (AMD 4737) (AMD 8721) (AMD 8963)*
Specifies metric sizes for dimensionally co-ordinated internal and external wood doorsets, door leaves and frames.

British Woodworking Federation

[Guide to specifying wood doors](#)

There are a formidable number of different types of wood or wood based doors on the market, some have a specific end use but others can satisfy several different uses. The purpose of this guide is to identify the different types and provide guidance in their correct specification.

[Guide 9](#) *Moulded skin wood fibre doors*

Good practice advice on the storage, installation and finishing of moulded skin wood fibre doors.

[Guide 11](#) *Care of timber doors on site. 2001 revision*

Document History - First published - 1996

Good practice advice on the delivery and storage, installation and finishing of timber doors.

Door and Hardware Federation

[Technical Specification 003](#) *Selectively applied door opening restrictors for security purposes*

In the absence of existing official guidance, this document recommends the level of performance door opening restrictors should achieve in order to ensure the safety of users. Encompasses restrictors designed to be used on wooden doors (or door-height windows) in buildings permitting sufficient opening to assist identification and allow

conversation, but not able to withstand excessive damage. Suggests normative references, definitions, classification, requirements, test methods, and marking.

English Heritage

[Timber panelled doors and fire - upgrading the fire resistance performance of timber panelled doors and frames](#)

This guidance note is designed to help those who own, manage, or are professionally concerned with modifying existing joinery doorsets in historic buildings, to achieve acceptable levels of fire and cold smoke resistance.

Guild of Architectural Ironmongers

[Technical Manual 1.8 Timber, joinery, doors and frames](#)

Document History - Supersedes - Timber, joinery, doors and window construction, 1998

This manual sets out the door types generally in use and provides details of the materials used and their construction.

TRADA Technology

[Wood Information Sheet 1/47 Timber external doors](#)

Covers legislative and performance requirements, timber selection, design considerations, finishing treatments, together with guidance on storage and installation, which can often be critical in the overall performance of the doorset in use.

Rigid sheet cladding/timber weatherboarding

Architects' Journal

[Architects' Journal Art of Construction](#) *Timber external walls. AJ 29.7.81*

[Architects' Journal Building Study](#) *Lodging an appeal. Whithurst Park Cottage, Sussex. AJ 29.11.2001*

Private house, Whithurst Park Cottage in Sussex, England. Based on the barn aesthetic, the building features extensive use of timber in the interior and for the external cladding. Gives costs information. Working details of the concrete and steel-framed house with rainscreen and gutter. Architect: James Gorst Architects. Structural engineers: Alan Conisbee & Associates

[Architects' Journal Working Details](#) *External wall: scenery workshop. AJ 22.4.92*

Engineered Wood Association

[Performance rated sidings](#)

This guide describes the features of APA rated siding and shows the variety of patterns and textures that are available. This guide also includes recommendations for finishing and refinishing exterior sidings.

Aurum Press Limited

[Georgian house / Part 9 - Wood siding or weatherboarding. \(10 of 25\)](#)

Document History - This document is part of a larger document, the Georgian House, which has been split into parts for ease of use.

Designed to instruct in the techniques of Georgian building. Covers types of Georgian houses such as British and American, with examples of styles. Also covers building techniques in brick and stonework, render, weatherboarding, windows, roofs, ironwork, mouldings, floors and stairs, internal decoration, soft furnishings and lighting.

British Board of Agrement

[Certificate 86/1787 Petrarch Cladding Ltd. Petrarch external sheeting. 3rd issue](#)

Document History - Replaces - 83/1175

Relates to petrarch external sheeting, consisting of slate and stone fillers with a polyester resin binder and glass-fibre reinforcement

[Certificate 91/2622 SBP Limited. Swish co-extruded cellular PVC-u cladding system. 3rd issue](#)

Framed PVC-U cladding, supplied in white planks with shiplap, open 'V', Tee Gee and feather-edge joints. For use externally on buildings as a decorative and protective facing.

[Certificate 04/4147 James Hardie Building Products Ltd. Hardiplank siding](#)

Relates to Hardiplank siding, fibre-reinforced cement siding weatherboards. The product is designed to be used as an exterior non-loadbearing lap cladding. It may be fixed horizontally, vertically or diagonally over braced timber stud walls or conventional masonry.

[Certificate 05/4197 G.A.P. Limited. Homeline cellular PVC-U cladding system](#)

Relates to the Homeline cellular PVC-U cladding system.

BRE

[Digest 500 Using UK-grown Sitka spruce for external cladding](#)

Reviews work within projects funded by the EU Northern Periphery Programme and the Forestry Commission. The project has collated and analysed information available on properties and treatment for Sitka spruce, to enable selection of material suitable for the required service life of cladding. The project has shown that the end product can potentially have a service life beyond that which is currently achieved.

National Federation of Roofing Contractors

[Technical Bulletin 34 Wooden shingles](#)

Attempts to give guidance in using and specifying a roof covering system formed from wooden shingles.

Nordic Timber Council

[Exterior cladding of redwood and whitewood](#)

This book has been published as a guide to potential specifiers and users on selection of a timber cladding and how to detail in order to ensure long life and compliance with Building Regulations.

TRADA Technology

[Design Guide 3 External timber cladding](#)

This document provides guidance to designers and specifiers to enable best practice principles to be applied to external timber cladding. This document covers solid timber, softwood and hardwood cladding.

Timber shingling

Architects' Journal

[Cedar shingles. AJ 10.9.86](#)

[Architects' Journal Working Details Structure and roof: heritage centre. AJ 23.10.91](#)

Defence Estates

[Historic Buildings Factsheet T 3.04 Roofs: thatch and shingle](#)

Document History - This set was formerly known as - Design and maintenance guides for historic buildings.

Looks at identification, netting, fire prevention and overcoating, re-thatching, re-ridging and minor repairs in relation to thatched roofs, and re-roofing and repairs for oak shingles.

Timber board flooring, etc

BRE

[Digest 477 Part 1 Wood based panels: oriented strand board \(OSB\)](#)

Oriented strand board (OSB) is now recognised as a wood-based panel in its own right, competing with other wood-based panels in many structural and non-structural applications as well as establishing itself in certain specialised areas. Describes this product and provides information regarding its performance in general terms. Also provides guidance on the use of OSB and how to select and specify the different grades in accordance with the European Standard EN 300. It also demonstrates how mandatory compliance with the Construction Products Directive can be achieved.

[Information Paper 2/04 Wood plastic composites: market drivers and opportunities in Europe](#)

Wood and polymers are working together to bring new performance properties previously unavailable. Heightened demand for Wood Polymer Composite (WPC) products is driven by greater durability, lower maintenance, lighter weight, and lower cost across all major applications. Briefly covers the content and manufacture of WPCs and their benefits and disadvantages from a market point of view.

[Information Paper 4/04 Recycling fibre reinforced polymers in the construction industry](#)

Reviews fibre reinforced polymer (FRP) recycling initiatives and techniques, materials usage and current practice. Technical, economic and policy issues necessary to improve the future recyclability of FRPs are discussed, and the refurbishment potential and possibility of re-use of FRP components are investigated.

[Information Paper 5/04 Fibre reinforced polymer materials in construction](#)

Provides information to assist with the effective specification and application of fibre reinforced polymers (FRPs) in construction. Gives a brief review of design and specification considerations which may lead to the choice of FRPs, and outlines the key benefits. Some typical applications in buildings and infrastructure are briefly covered.

British Woodworking Federation

[Guide 7 Medium density fibreboard \(MDF\). 2000 revision](#)

Document History - First published - 1997

Provides information on MDF, particularly on the risks to health associated with machining it.

Timber strip/board fine flooring, laminate flooring, etc

British Standards Institution

[BS 8425:2003 Code of practice for installation of laminate floor coverings](#)

British Woodworking Federation

[Guide 7 Medium density fibreboard \(MDF\). 2000 revision](#)

Document History - First published - 1997

Provides information on MDF, particularly on the risks to health associated with machining it.

Timber/joinery

Architects' Journal

[Dry rot - an alternative approach. AJ 18.9.85](#)

[Tropical hardwoods: Fruits of the forest. AJ 8.8.90](#)

[Timber: design for durability. AJ 9.9.92](#)

[AJ Focus Timber, joinery and finishes. AJ Focus 6.88](#)

[Architects' Journal Timber in Construction Trade and materials. AJ 10.7.91](#)

[Architects' Journal Working Details Internal joinery: chapel. AJ 1.7.92](#)

British Board of Agreement

[Certificate 92/2813](#) *Trus Joist MacMillan - Limited Partnership. Parallam PSL (parallel strand lumber). Third issue*

Wood-based material for use in structural members (e.g. beams, ties, struts) or structural framing and also for the fabrication of built-up components such as trusses and panels.

[Certificate 99/3619](#) *Boise Cascade Sales Ltd. Versa-lam SP LVL (laminated veneer lumber)*

A wood based material for use in structural members and for the fabrication of built up components such as trusses and panels.

BRE Certification

[Certificate 038/96](#) *MiTek M20 punched metal plate timber fasteners (March 2005 reissue)*

Document History - Previous edition issued by WIMLAS.

MiTek M20 punched metal plate timber fasteners have been assessed to confirm their suitability for use as mechanical fastenings for joints in factory-manufactured timber structural components in which all members lie in one plane. The fasteners are galvanised steel plates with integral nails that are fully pressed into the adjoining timber members.

BRE

[Digest 307](#) *Identifying damage by wood-boring insects*

A number of insects are able to use wood as a food source and some of these may cause serious damage to building timbers in the UK. This Digest introduces wood-boring insects and illustrates the types of damage which are serious enough to require remedial treatment, distinguishing them from other, less significant types of damage. Digest 327 gives recommendations on appropriate remedial treatments.

[Digest 345](#) *Wet rots: recognition and control*

Decay of timber occurs only when wood is allowed to remain permanently or regularly damp. In buildings, decay is described as either wet rot or dry rot; although both can occur together in damp wood, what type of rot develops depends to some extent on the conditions in the building. The same basic principles govern the successful eradication of both types of rot but additional measures are necessary with dry rot because of its ability to grow through masonry. This Digest describes: i) the main types of wet rot likely to be encountered in buildings; ii) how to distinguish them from dry rot; iii) the strategy for their control.

[Digest 407](#) *Timber for joinery*

Document History - Replaces - BRE Digest 321

More than half of the UK consumption of hardwood, and about 10% of the softwood, is used for joinery, such as windows, doors and stairs. From the wide choice of timber types, it is important for the user to be able to specify the quality of wood and its moisture content appropriate to the end use. This Digest provides information on timber used in joinery and gives guidance on selection.

[Digest 417](#) *Hardwoods for construction and joinery: current and future sources of supply*

This digest describes the significant changes occurring in the supply of hardwood timber in the UK, particularly in the types of wood and relative amounts imported from tropical regions. It discusses the importance of identifying sustainable and well-managed sources and the difficulties of defining sustainability. It suggests that greater use can be made of lesser-known or lesser-used species, and of material from plantations, provided adequate data are obtained on their relevant properties. This digest lists 16 timbers that are expected to be of increasing significance in the near future. BRE is evaluating the properties of many of them.

[Digest 422](#) *Painting exterior wood*

Document History - Replaces - BRE Digest 354, 261, and 106

This Digest explains the principles underlying the successful application of paint to exterior wood and gives details of paint systems and of the initial and maintenance painting process. The structure of wood and its effects on the application and durability of paint are discussed, together with moisture content and dimensional changes, effects of surface finish and end grain sealing. The Digest also considers external influences such as water, solar radiation, micro-organisms and the risk of decay.

[Digest 429](#) *Timbers: their natural durability and resistance to preservative treatment*

Document History - Replaces - BRE Digest 296

Timber exposed to moisture for any length of time is at risk from attack by wood-rotting fungi. To obtain a good service life, it is important to select a timber species that is either naturally durable or amenable to preservative treatment. This digest explains the classification of durability and treatability for timber, and classifies these properties for over 150 species.

[Digest 431 Part 1](#) *Hardwoods for joinery and construction: technical assessment methods*

Digest 417 lists 16 lesser-known species of timber that show potential for new or wider application in construction. This set of Digests give the results of tests carried out on each of these species. This first part describes the technical assessment methods used.

[Digest 431 Part 2](#) *Hardwoods for joinery and construction: test results and recommendations*

Digest 417 lists 16 lesser-known species of timber that show potential for new or wider application in construction. This set of Digests give the results of tests carried out on each of these species. This second part gives the results and recommendations for bintangor, hevea, kamarare, niowe, taun and Ghanaian plantation teak.

[Digest 431 Part 3](#) *Hardwoods for joinery and construction: test results and recommendations*

Digest 417 lists 16 lesser-known species of timber that show potential for new or wider application in construction. This set of Digests give the results of tests carried out on each of these species. This third part gives results and recommendation for andiroba, dahoma, gmelina, American red oak, Tanzanian plantation teak, and vitex.

[Digest 466](#) *EN 927: the new European standard for exterior wood coatings*

Describes a comprehensive set of new European standards for exterior wood coatings. EN 927 is in five parts and comprises a guide to selection, a specification for assessing the performance of different types of wood coating systems in relation to end use and test methods for natural weathering and water absorption.

[Digest 480](#) *Wood plastic composites and plastic lumber*

Wood plastic composite (WPC) is a term which refers to a composite containing wood in any form, combined with either thermoplastics or thermoset plastics. Thermoplastics include polyethylene and polypropylene which are used in numerous non-structural applications, such as bottles and containers. Thermoset plastics are formed from resins such as polyester and epoxy. Solid recycled plastic lumber (RPL), which is usually made from waste plastics without any wood or fibre element, also competes in this non-structural role.

[Digest 481](#) *Timber bridges*

Timber is a highly versatile construction material, strong and lightweight, with tremendous ease of handling and workability. Correctly selected it has good durability, particularly in relation to de-icing salts. Bridges made from wood also tend to exhibit a natural empathy with the landscape. For the bridge designer, using timber offers a multitude of possible bridge forms ranging from simple beams to glue laminated arches, trusses and space frames. Timber can also be used in conjunction with other materials such as natural stone, stainless steel and glass.

[Digest 483](#) *Wind loads on temporary stage decks*

Temporary stages used for outdoor events are generally free-standing structures with a flat timber deck supported on system scaffolding or other proprietary systems. General guidance on the design, use and procurement of these structures is given in Temporary demountable structures (Institution of Structural Engineers), but it does not include guidance for wind loads on temporary stage decks. This Digest provides a procedure for designing temporary stage structures for wind loads that follows BS 6399-2 Code of practice for wind loads

[Digest 492](#) *Timber grading and scanning*

Details advances in grading and scanning technology, for both logs and sawn timber, and changes to structural timber grading due to European harmonisation.

[Good Building Guide 64 Part 1](#) *Tiling and slating pitched roofs: design criteria, underlays and battens*

Deals with the upper surfaces of pitched tiled or slated roofing. Concentrates on those aspects of tiling and slating which could lead to deficiencies in the performance of the completed roof. Aims to provide practitioners with a summary of the main good practice criteria. Covers general principles applicable to all forms of tiling and slating, together with criteria where requirements for ancillary materials and practices are common to both tiles and slates, such as weather resistance and underlay specifications and some aspects of work on site.

[Good Building Guide 64 Part 2](#) *Tiling and slating pitched roofs: plain profiled clay and concrete tiles*

Deals with the upper surfaces of pitched tiled or slated roofing. Concentrates on those

aspects of tiling and slating which could lead to deficiencies in the performance of the completed roof. Aims to provide practitioners with a summary of the main good practice criteria. Covers battening, nailing and product and material quality requirements for tiles.

[Good Repair Guide 12](#) *Wood rot: assessing and treating decay*

[Information Paper 16/79](#) *Effect of dimensional tolerances on machine graded timber*

[Information Paper 24/79](#) *Effect of flame-retardant treatments on some mechanical properties of wood*

[Information Paper 10/80](#) *Avoiding joinery decay by design*

[Information Paper 14/80](#) *Grumixava (*Micropholis gardnerianum*)*

[Information Paper 8/81](#) *Tatajuba (*Bagassa guianensis*)*

[Information Paper 9/81](#) *Termite resistance of board materials*

[Information Paper 5/83](#) *Cerejeira (*Amburana acreana*, *Amburana cearensis*)*

[Information Paper 2/84](#) *Canafistula (*Peltophorum vogelianum*)*

[Information Paper 17/84](#) *Timber stress grading machines*

[Information Paper 9/91](#) *Blue staining of timber in service: its cause, prevention and treatment*

This paper describes the defective timber known as 'blue stain in service', caused by the growth of a particular group of fungi. It indicates the conditions required for the growth of the fungi, the means of preventing the defect and the remedial treatment necessary to prevent further development.

[Information Paper 8/98](#) *Reducing kiln-drying twist of Sitka spruce*

This paper evaluates the extent and significance of twist in UK-grown and commercially prepared Sitka spruce. It describes how top weighting during kiln drying, together with modified kiln schedules, can reduce twisting, and demonstrates generally good distortional stability of dried timber under subsequent fluctuating humidity conditions in storage and use.

[Information Paper 14/01](#) *Durability of timber in ground contact*

This paper reports recent findings from a programme of testing at BRE to benchmark the performance of timber in ground contact. It concludes that most of the new hardwood species becoming available in the UK are of limited durability. It recognises, though, that treatment can extend the service life of many softwood species. This paper complements IP 6/99, IP 2/01 and Digest 429.

[Information Paper 9/03](#) *Best practice of timber waste management*

Presents the practical issues that affect timber waste in UK construction. Describes timber sources, composition, use and waste, and markets for recycling and disposal

together with the plant and machinery necessary to exploit this resource. It proposes a timber waste classification. The various types of equipment for processing waste timber are listed; legislation covering the disposal of waste timber is briefly mentioned. This material is then drawn together to provide the best practicable environmental option for timber waste, and a model is tested to provide two examples of what could be achieved.

[Information Paper 10/05](#) *Green gluing of timber: a feasibility study*

Reports on the technical and commercial feasibility of creating a green gluing enterprise in the Greenwood Community Forest in the East Midlands. Results from the study strongly indicate that this enterprise would be commercially viable. The steps required for its implementation are outlined in this Information Paper.

[Information Paper 13/05](#) *Incising UK grown Sitka spruce*

Provides a platform for understanding the potential opportunities and benefits of incising spruce, and for increasing the end use applications of UK-grown timber. Gives results of field trials and laboratory tests which show how incising the timber can improve penetration of preservative, increasing durability.

[Report 48](#) *Determination of softwood strength properties for grades, strength classes and laminated timber for BS 5268:Part 2*

[Report 233](#) *Briefing guide for timber framed housing*

Document History - Included in BRE Report 469 - Non traditional houses.

To assist those who wish to use the timber frame construction method but are not experienced in, or are familiar with, its principles. It attempts to point designers and specifiers toward best practice so that they will be able to produce houses with adequate long term performance.

[Report 241](#) *Strength properties of timber (3rd ed.)*

This report describes testing procedures and presents the results of physical and mechanical tests on 223 hardwoods and softwoods in the green (unseasoned) and dry (seasoned) conditions.

[Report 311](#) *Biological durability of timber in ground contact*

When timber becomes wet it is liable to attack by wood-destroying fungi which eventually can cause the wood to rot. This condition arises when timber is used in damp or wet environments, such as in contact with the ground, or is exposed to rainfall or condensation. This report is concerned with the on-going, long-term BRE ground contact field trials where stakes of different wood species are half-buried in the ground. To simplify the terminology in this report, 'biological natural durability' will be used to refer to the resistance of a timber to attack by wood-destroying fungi in ground contact. The report presents and reviews the results and considers different ways of analysing the data for use in specifying timber performance.

[Report 321](#) *Timber drying manual. 3rd edition*

Document History - First edition published 1974

[Report 323](#) *Timber in construction: challenges for the future*

Proceedings of the BRE 75th anniversary seminar, in collaboration with TRADA

Technology Ltd. Topics covered: Prospects for timber in construction and Timber - the natural choice.

[Report 329](#) *Strength properties of timber: 1997 supplement*

This supplement to the BRE Report The strength properties of timber[1], provides a summary of the physical and mechanical properties of 12 timber species supplied from current commercial resources. Small clear test samples were prepared, conditioned at 20 ° C and 65 per cent relative humidity, and tested in accordance with British Standard BS 373: 1957[2]. Test results include moisture content, density, specific gravity, modulus of rupture and modulus of elasticity from static bending tests, impact strength, and compression strength parallel to the grain.

[Report 400](#) *Handbook of hardwoods with 1997 supplement*

Document History - This edition comprises a facsimile reprint of the 1972 edition and the supplement published in 1997. Combines rather than supersedes these documents. Provides fundamental information and data on timbers available to the UK. Data on strength properties, working properties and plywood manufacture are included.

[Report 407](#) *Wood bending handbook*

Document History - Facsimile reprint 2000.

Addresses the selection and preparation of bending material, softening treatments, hand bending, machine bending, the setting of bends, the process of laminated bending, pressing laminations to shape, curved structural laminated members, the movement and distortion of laminated bends, factors affecting the bending of plywood, production of plywood bends, and theoretical considerations.

[Technical Note 10](#) *Strength of timber*

[Technical Note 38](#) *Movement of timbers*

[Technical Note 46](#) *Moisture content of timber in use*

British Standards Institution

[BS 1186-2:1988](#) *Timber for and workmanship in joinery. Specification for workmanship (AMD 9385)*

Requirements for the fit of parts in various details of joinery.

[BS 1186-3:1990](#) *Timber for and workmanship in joinery. Specification for wood trim and its fixing (AMD 9386)*

Requirements for the species, moisture content, classification, quality and workmanship of fixings.

[BS 5756:1997](#) *Visual strength grading of hardwood*

Specifies the grading requirements for one grade of structural tropical hardwood and four grades of structural temperate hardwood.

[BS 8000-5:1990](#) *Workmanship on building sites. Code of practice for carpentry, joinery and general fixings*

Recommendations on basic workmanship.

[BS EN 336:2003](#) *Structural timber - Sizes, permitted deviations (AMD Corrigendum 14533) (AMD 16208)*

Document History - Supersedes BS EN 336:1995. Amendment 14533 is Corrigendum No.1 dated July 2003. Amendment 16208 dated March 2006.

Specification is given for classes and moisture content of permitted deviations from target sizes for structural timber of softwood and hardwood species. Can be applied to sawn and prepared square-edged timber with parallel edges having sawn thickness or widths in the range 22 mm to 300 mm.

[BS EN 338:2003](#) *Structural timber - Strength classes*

Document History - Supersedes BS EN 338:1995

Characteristic strength, stiffness properties and density values are given.

[BS EN 350-2:1994](#) *Durability of wood and wood-based products - Natural durability of solid wood. Guide to natural durability and treatability of selected wood species of importance in Europe*

[BS EN 942:1996](#) *Timber in joinery - general classification of timber quality*

Document History - Supersedes BS 1186-1:1991

[BS EN 1313-1:1997](#) *Round and sawn timber - permitted deviations and preferred sizes. Softwood sawn timber (AMD 11020)*

Document History - Supersedes BS 4471: 1987

This standard specifies permitted deviations for thicknesses and widths at a reference moisture content and adjustments for changes in size due to changes in moisture content. This standard applies to softwood sawn timber.

[BS EN 1313-2:1999](#) *Round and sawn timber - permitted deviations and preferred sizes. Hardwood sawn timber (AMD Corrigendum 10981)*

Document History - Supersedes BS 5450:1977. Amendment 10981 is Corrigendum No. 1

[BS EN 1912:2004](#) *Structural timber - Strength classes - Assignment of visual grades and species*

Document History - Supersedes BS EN 1912:1998

Lists the grades of timber from various national standards that satisfy the requirements of European standard strength classes

British Woodworking Federation

[Hardwood at work: guide for specifiers](#)

This brochure has been produced to guide specifiers in selecting the most suitable hardwood for the job.

[Guide 4](#) *Resin exudation in joinery timber. 1998 revision*

Document History - First published - 1996

Gives general advice on the cause of resin exudation in joinery timber and the procedures which can reduce its effect in service.

[Guide 5 COSHH and the joinery manufacturer. 1998 revision](#)

Document History - First published - 1997

Gives general advice on the Control of Substances hazardous to Health Regulations 1994, with regard to joinery manufacturers.

Chartered Institute of Building

[Procuring legal and sustainable timber: a construction industry guide](#)

Aimed at enabling the construction industry to procure sustainable timber in the most straightforward way. Provides directions for producing a Timber Procurement Policy in order to ensure timber is obtained from a sustainable or well-managed source.

Council of Forest Industries

[Introduction to selected grades of Canadian Timber in the UK](#)

This brochure explains the principles used in defining grades of clear, factory and shop, and construction timber.

Croft Consultants

[Wetland timber decked paths](#)

Provides guidance as to when it is appropriate to build paths in wetlands, and what should be considered when they are being constructed.

Department of the Environment

[Handbook of hardwoods](#)

This book aims to provide information that will assist users of hardwoods to select the timbers best suited to their purposes and to process them in the most satisfactory manner, having regard to the individual features of each timber. In all, the book provides full descriptions of 117 hardwoods and a further 103 are described more briefly.

English Heritage

[Waterlogged wood - guidelines on the recording, sampling, conservation, and curation of waterlogged wood](#)

This document aims to set out some general guidelines on national recording policies, site sampling and conservation strategies, planning and running of projects involving waterlogged wood and any special considerations that should be taken into account when formulating and implementing such policies.

[Practical building conservation. Volume 5: Wood, glass and resins](#)

The sections on wood analyse the problems of fungi, insects and timber distortion and explore the use of substitute materials and finishes for external surfaces. Techniques for conservation of historic glass include an evaluation of cleaning methods, treatment of paint loss and how to protect glass from vandalism, breakage and the problems of variable climatic conditions.

Forestry Commission

[Information Note 42 Timber cladding in Scotland](#)

Outlines the development of timber cladding in Scotland, describes the range of historical timber clad buildings that currently exist and provides practical information on the specification and detailing of external timber cladding for Scottish conditions. The technical issues covered include: design for durability, choice of timber species, suitable coatings, and energy efficiency.

Glued Laminated Timber Association

[Engineered timber](#)

Types of engineered timber covered include glulam, LVL (Laminated Veneer Lumber) and its derivatives. These notes comment on structural forms with rules of thumb for initial sizing.

Health and Safety Executive

[Health and Safety: Legal Series L 114 Safe use of woodworking machinery. Provision and use of work equipment regulations 1998 as applied to woodworking machinery](#)
Sets out the regulations of PUWER 98 where specific Approved Code of Practice and guidance material is necessary for woodworking machinery. Reflects on widely accepted precautions. Covers the provision of information and training as well as aspects of guarding. Applies to machinery (not hand-held tools) used for wood, cork and fibreboard.

Nordic Timber Council

[Swedish and Finnish whitewood](#)

This publication gives comprehensive information about the properties and uses of Nordic Whitewood. Details include; durability, preservation, fire performance, machining etc.

[Properties of Swedish and Finnish redwood and whitewood](#)

Presents in one booklet the majority of the properties of Swedish and Finnish Redwood and Whitewood which will normally be required by architects, engineers, builders etc.

[How to specify Swedish and Finnish redwood and whitewood](#)

This booklet is intended to be a guide for architects, engineers, quantity surveyors, designers, manufacturers, builders and buyers when specifying Swedish and Finnish Redwood and Whitewood for end uses.

Scottish Executive

[Timber cladding in Scotland](#)

This report highlights the issues and use of timber cladding in Scotland. Looking at benefits, the current market and attitudes, sustainability and the future, historical information and factors in the development of use of timber cladding. Other considerations include durability, weather effects and recommendations for best practice in specifications and detailing. There are several case studies detailing specific varieties of cladding used in various projects.

Society for the Protection of Ancient Buildings

[Information Sheet 2 Timber treatment](#)

This publication provides a warning about the defrassing of timbers.

TRADA Technology

[Timber pole construction: an introduction. 2nd edition](#)

This document gives a general introduction to timber poles as a construction material, and covers the processes of harvesting and protecting the poles through to specific applications in the construction of domestic and industrial buildings.

[British grown hardwoods: the designers handbook](#)

Covers structural applications, landscape design, external and internal joinery and floors with information on environmental aspects and the characteristics and implications for design.

[Timber in construction / Chapter 0 - Contents and introduction. \(1 of 15\)](#)

Document History - This is the 1987 reprint. This document is part of a larger document, Timber in Construction, which has been split into parts for ease of use. This book has been prepared by the Timber Research and Development Association as part of its 50th anniversary celebrations. There has long been a need for an authoritative reference book on the use of timbers in construction for architects and specifiers and for students in these fields. This book, with each chapter written by a specialist in the subject, is intended to fill that gap.

[Timber in construction / Chapter 1 - Timber. \(2 of 15\)](#)

Document History - This is the 1987 reprint. This document is part of a larger document, Timber in Construction, which has been split into parts for ease of use. This book has been prepared by the Timber Research and Development Association as part of its 50th anniversary celebrations. There has long been a need for an authoritative reference book on the use of timbers in construction for architects and specifiers and for students in these fields. This book, with each chapter written by a specialist in the subject, is intended to fill that gap.

[Timber in construction / Chapter 4 - Specifying timber. \(5 of 15\)](#)

Document History - This is the 1987 reprint. This document is part of a larger document, Timber in Construction, which has been split into parts for ease of use. This book has been prepared by the Timber Research and Development Association as part of its 50th anniversary celebrations. There has long been a need for an authoritative reference book on the use of timbers in construction for architects and specifiers and for students in these fields. This book, with each chapter written by a specialist in the subject, is intended to fill that gap.

[Timber for marine and fresh water construction](#)

Document History - Document reference number: TBL 21

The aim of this publication is to show how timber can provide a solution to many of the problems confronting dock, harbour and river board engineers and others, concerned with water construction.

[Research Paper 1/2003](#) *Timber supply chain: environmental impacts*

Introduces concepts and some statistics relating to the whole subject of environmental impacts and supply chain factors, looking firstly at transport in general, with some lessons from other industries and then more specifically at the transport of timber products. Secondly the effect and implications of e-commerce on supply chains are examined and finally the factors that can disrupt supply chains are discussed. A glossary of terms is also included.

[Technology Report 4/99](#) *From sawmill to customer: wax treatments for timber protection*

Document History - Alternative series title Research Report 4/99

This project was undertaken to determine whether the treatment of timber with wax emulsions has potential for use by UK sawmillers. A combination of experiment and practical trials was undertaken to explore the claimed advantages of wax emulsion treatments and to assess the impact of some of the side effects.

[Technology Report 6/99](#) *Wood residue: waste or resource*

Document History - Alternative series title Research Report 6/99

Produced as a result of a survey amongst timber processors through to demolition and reclamation companies, this report identifies types of residues and their use or disposal.

[Technology Report 5/2000](#) *UK softwood drying: a best practice guide*

Document History - Alternative series title Research Report 5/2000

This report presents notes on a number of recent advances in softwood timber drying that can be applied to the UK industry through a targeted research, development and implementation programme.

[Wood Information Sheet 1/25](#) *Structural use of timber: An introduction to BS 5268-2:2002 (January 2003 edition)*

[Wood Information Sheet 1/31](#) *Timber for landscape architecture*

This information sheet gives guidance to specifiers and users of timber in the area broadly described as landscape architecture; i.e. wood used outdoors e.g. bridges, towers, poles etc. but excluding habitable buildings.

[Wood Information Sheet 1/42](#) *Timber I-joists - applications and design (2003 revision)*

Looks at the applications and uses of timber-I-joists and outlines some of the considerations and possibilities of utilising UK material for I-joist manufacture.

[Wood Information Sheet 2.3/ 1A](#) *Finishes for exterior timber: appendix - product list*

This appendix is a list of products found to be 'satisfactory' in performance in natural exposure tests on smoothly machined softwood cladding.

[Wood Information Sheet 2.3/ 6](#) *Wood decorative and practical (June 1999 revision)*

This information sheet gives information and includes photographs of a core selection of 48 timbers which are generally available or are commonly used in the UK.

[Wood Information Sheet 2.3/10](#) *Timbers - their properties and uses (includes 2002 amendment)*

Document History - 1999 edition with 2002 amendment

Covers the colour, density, texture, moisture movement, working qualities, durability, treatability, availability, price, use and size characteristics of a range of timber species, with additional commentary.

[Wood Information Sheet 2.3/18](#) *Kiln treatment for sterilisation of insect-infested timber*

This information sheet has been produced to assist a kiln dryer or other person faced with the task of eradicating an insect infestation of timber or timber products by heat treatment.

[Wood Information Sheet 2.3/28](#) *Introducing wood (February 2003 revision)*

Document History - Revised February 2003

This sheet explains the terms used when describing timbers and their properties.

[Wood Information Sheet 2.3/31](#) *Adhesively-bonded timber connections - adhesives and timber construction (June 2003 revision)*

Document History - Supersedes 1992 version

This information sheet is concerned only with the use of adhesives in structural joints.

[Wood Information Sheet 2.3/37](#) *Softwood sizes*

Document History - Supersedes 2002 revision

Identifies the preferred sizes recognised by the European market for softwood timber produced by sawmills. Figures provided for sawn softwood, machined timber, surfaced timber and planed timber. Takes into account deviation between actual and target sizes given moisture content.

[Wood Information Sheet 2.3/54](#) *Exterior coatings on 'alternative' hardwoods*

[Wood Information Sheet 2.3/56](#) *CE marking: implications for timber products*

The Construction Products Directive (89/106/EEC) sets out six Essential Requirements with which all structures subject to regulation must comply: Mechanical resistance and stability, Safety in case of fire, Hygiene, health and environment, Safety in use, Protection against noise, and Energy, economy and heat retention. Covers the requirements of timber under the CE marking scheme, which allows trading of timber in other member states of the EU.

[Wood Information Sheet 2.3/57](#) *Specifying wood-based panels for structural use*

Covers design considerations, correct specification, maintaining fitness for purpose and includes some example specifications.

[Wood Information Sheet 4/7](#) *Timber strength grading and strength classes (February 2003 revision)*

Document History - Revises the 1996 edition. Change of title

[Wood Information Sheet 4/12](#) *Care of timber and wood-based products on building sites*

This document covers; moisture content at time of erection; care in manufacture and delivery; storing timber on site and; building programme.

[Wood Information Sheet 4/14](#) *Moisture in timber*

This information sheet provides basic information for the specifier and user on the facts and importance of the moisture content of wood.

[Wood Information Sheet 4/18](#) *Moisture meters for wood (with 97 amendment)*

This information sheet discusses the use of moisture meters for timber, their suitability for particular purposes and provides a checklist for good operating practice.

[Wood Information Sheet 4/19](#) *European standards on timber*

[Wood Information Sheet 4/23](#) *Non-destructive testing of timber (2004 revision)*

Provides an introduction to non-destructive testing of timber in buildings and other structures for architects, engineers, surveyors and building inspectors. The various NDT techniques are discussed, together with their capabilities and limitations. Potential future developments are outlined.

[Wood Information Sheet 4/28](#) *Durability by design. 2nd edition*

Document History - 1st edition published 1998

The life of timber components can be extended considerably by attention to detail at the design stage. Achieving 'durability by design' requires a designer first to target and define performance and maintenance expectations and then to specify and detail appropriately.

Fixings for timber

British Board of Agreement

[Certificate 89/2290](#) *Wolf Systems Ltd. Punched metal plate timber fasteners*

Steel plates with integral nails used to connect the timber members of internally used framed structural components within the same plane. Detail Sheets cover: (Building regulations), (2) Wolf 100 punched metal plate timber fasteners, (3) Wolf 12N Punched Metal Plate Timber Fasteners and (4) British sitka spruce for use with wolf punched metal plate timber fasteners.

[Certificate 90/2383](#) *Twinaplate Ltd. Punched metal plate timber fasteners. Twinaplate punched metal plate timber fasteners.*

Steel plates with integral nails, used to connect the members of internally-used timber components (such as trusses) at any angle within the same plane. Detail Sheets cover: (2) replaces 83/1146) 18 Gauge, (3) (replaces 81/1426) Twistnail, (4) Second issue (replaces 83/1252) Tap 16, and (5) New Zealand Radiata Pine for use with Timber Fasteners.

[Certificate 90/2385](#) *Truswal Systems Ltd. Punched metal plate timber fasteners*

Steel plates with integral nails, used to connect the members of internally used framed timber structural components (such as trusses) at any angle within the same plane. Detail Sheets cover: (2) (83/1180) Trus-Nail 20 Gauge, (3) New Zealand Radiata Pine for use with Timber Fasteners.

[Certificate 90/2386](#) *Hydro-Air International (UK) Ltd. Punched metal plate timber fasteners*

Steel plates with integral nails, used to connect the members of internally used framed timber structural components (such as trusses) at any angle within the same plane. Detail Sheets cover: (2) (replaces 83/1213) Hydro-Air 18 Gauge, (3) (replaces 84/1405) Hydro-Nail Posi-Tooth, (4) (replaces 79/702) Bevplate 'Series 70', (5) (replaces 84/1431) Bevplate 90, (6) (replaces 83/1177) Bevplate HS, (7) (replaces 85/1546) Bevplate 805, (8) (replaces 85/1484) AB Traforband T150, and (9) New Zealand Radiata Pine for use with Timber Fasteners..

[Certificate 90/2413](#) *Gang-Nail Systems Ltd. Punched metal plate timber fasteners*

Steel plates with integral nails, used to connect the members of internally used framed timber structural components (such as trusses) at any angle within the same frame. Detail Sheets cover: (2) (replaces 80/746) Gang-Nail 14 Gauge, (3) (replaces 80/747) Gang-Nail 18 Gauge, (5) (replaces Detail Sheet 4) Gang-Nail 20 Gauge, (6) New Zealand Radiata Pine for use with Timber Fasteners, and (7) British Sitka Spruce for use with Gang Nail Punched Metal Plate Timber Fasteners.

[Certificate 97/3432](#) *Simpson Strong-Tie. Camplate nailed plate timber fasteners.*

The fasteners are steel plates perforated with rows of holes through which the specified nails are driven, used to connect the members of internally used framed timber structural components (such as trusses) at any angle within the same plane.

[Certificate 05/4288](#) *Alpine Automation Ltd. Alpine punched metal plate timber fasteners*

Relates to Alpine punched metal plate timber fasteners, designed to connect the members of internally-used framed timber structural components at any angle within the same plane. Includes detail sheet: (2) Alpine A9 punched metal plate timber fasteners.

[Information Sheet 9](#) *Punched metal plate timber fasteners: specification for hot-dip zinc coated steel and quality control guidance notes*

[MOAT 16](#) *Directive for the assessment of punched metal plate timber fasteners*

BRE

[Digest 301](#) *Corrosion of metals by wood*

[Good Building Guide 21](#) *Joist hangers*

The use of joist hangers provides a quick, economic and reliable method for forming timber-to-timber joints and for supporting timbers on masonry or steel beams. This guide shows how to use hangers to support timber joists in new construction work, and stresses the importance of correct specification and installation to ensure good performance.

TRADA Technology

[Guidance Document GD 7](#) *Multiple fastener timber joints: guidance on BS 5268-2 and Eurocode 5. (January 2003 revision)*

Document History - Revised January 2003

Document explains the factors which affect the strength of multiple fastener joints and describes relevant research in this field. Provides new design recommendations for both BS 5268-2 and Eurocode 5.

[Wood Information Sheet 2.3/51](#) *Timber engineering hardware and connectors*

The term 'timber engineering hardware' encompasses a diverse range of metal components made of steel plate, sheet or strip which are used to connect timber members together, usually in conjunction with dowel-type metal fasteners. Timber engineering components have widely replaced traditional carpentry joints due to their ease of use, ready availability and the avoidance of complex machining of timber members. Typical examples of common types include joist hangers, framing anchors, truss clips and wall ties. Mass-produced timber engineering hardware is usually made from pre-galvanised mild steel, from 1mm-3mm thick. However, heavier components are also made for large structures in thicknesses up to 12mm, sometimes in proprietary forms. These thicker components are usually galvanised after manufacture; this has the advantage that the edges, which are otherwise exposed by cutting or drilling, are fully protected. Some manufacturers also supply stainless steel components to order.

[Wood Information Sheet 2.3/52](#) *Fasteners for structural timber: nails, screws, bolts and dowels*

Document History - Revision replaces 1995 version

Summarises the characteristics of different fasteners for structural timber. Also broadly considers design in relation to spacing rules, lateral loading, axial loading, slip, fire resistance and comparative performance.

WIMLAS

[Certificate 023/95](#) *Alpine A10 connector plates. Revision 1*

Document History - Updates, amendments and new building certificates are now published by BRE Certification (BRC).

For use as the mechanical fastening for joints in factory manufactured timber structural components in which all the members lie in one plane, such as trussed rafters.

Joinery

Architects' Journal

[Architects' Journal Timber in Construction](#) *Joinery. AJ 14.8.91*

BRE

[Defect Action Sheet 14](#) *Wood windows: preventing decay*

[Defect Action Sheet 66](#) *Windows, doors and exterior joinery: applying putty, oil-based sealants and solvent based paints, when weather may be bad*

[Information Paper 17/87](#) *Factory applied priming paints for exterior joinery*

The primer plays a key role in the performance of wood finishes, forming the bond between the wood surface (the substrate) and the finishing coat. Good primer performance is therefore essential if satisfactory results are to be achieved with exterior finishing systems. This paper presents the results of tests carried out to establish the weathering performance of currently available factory-applied primers and gives advice to specifiers and joinery manufacturers on their selection and use.

[Information Paper 20/87](#) *External joinery: end grain sealers and moisture control*

Effective moisture control is essential for maintaining the integrity of external joinery and achieving good paint performance. Since most water is absorbed through the end grain at joints, moisture uptake can best be prevented by sealing the end grain of joinery components before assembly. This Information Paper presents the results of an investigation into the effect of end grain sealing on the performance of external joinery and draws the attention of specifiers and manufacturers to the advantages it offers for improved performance of both the wood substrate and the paint film.

[Information Paper 10/91](#) *Selection of timber for exterior joinery from the genus Shorea*

Timber from the genus Shorea is imported to the United Kingdom as a mixture of species having a wide range of properties such as density, colour, treatability with preservatives, and durability (resistance to decay). This paper offers specifiers and joinery manufacturers a set of possible selection criteria for stocks, so as to reduce the risk of including timber vulnerable to decay. It suggests that the overall durability of Shorea timber used for joinery can be improved by a selection process based on colour and density, and indicates the importance of preservative treatment.

[Information Paper 2/92](#) *Factory-applied stain basecoats for exterior joinery*

Stain basecoats are being increasingly used by joinery manufacturers. They are dual-purpose products that enable users to finish with either a paint system or a wood stain. Research at BRE has shown a wide disparity in the weather resistance of stain basecoats, which can have major implications for the service life of the applied finishes. This paper, intended for suppliers and users, summarises current BRE advice on stain basecoats. It outlines the results of trials to evaluate the weathering properties of these coatings, and offers guidance on their selection and performance in service.

[Technical Note 12](#) *Flooring and joinery in new buildings: how to minimise dimensional changes*

British Standards Institution

[BS 8000-5:1990](#) *Workmanship on building sites. Code of practice for carpentry, joinery and general fixings*

Recommendations on basic workmanship.

British Woodworking Federation

[BWF guide to health and safety in the woodworking industry](#)

This guide is aimed at employers, the self employed and those in control of, or managing, work activities in the joinery and woodworking industry. It provides a

framework to assist in addressing the major health and safety issues within the workplace.

[Specifiers' guide 2006. Joinery and woodworking](#)

Lists the services and specialist skills offered by members of the BWF alphabetically and by county. Discusses the TWA and Fire Door and Doorset schemes. Identifies useful British and European woodworking standards.

Defence Estates

[Historic Buildings Factsheet T 6.02 Internal joinery](#)

Document History - This set was formerly known as - Design and maintenance guides for historic buildings.

Advises on the appropriate repair of internal joinery components. Aims to elucidate the causes of deterioration, historic development and the detailed construction of the component.

Guild of Architectural Ironmongers

[Technical Manual 1.8 Timber, joinery, doors and frames](#)

Document History - Supersedes - Timber, joinery, doors and window construction, 1998

This manual sets out the door types generally in use and provides details of the materials used and their construction.

Glued Laminated Timber Association

[Glulam specifiers guide](#)

Glulam is probably the fastest growing structural material in Britain. Between 1985 and 1995 consumption doubled. One of the reasons is the availability of standard Glulam components, often off-the-shelf. This has given architects and specifiers the opportunity to choose Glulam for almost every kind of building. This guide gives details of the various kinds of Glulam, their properties, performance and availability. It also contains a model specification to assist in defining precisely what is needed.

[Technical data sheet 1 Glulam in sports halls](#)

Summarises the relevant clauses and highlights their significance in relation to large section structural timber. It illustrates why the low fire loading in swimming pools and sports halls has justified waivers from strict interpretation of the clauses.

[Technical data sheet 2 Design for durability](#)

Many historic buildings give testimony to long-term durability of correctly designed structural timberwork. Preservation is a valuable tool but avoiding risk is always preferable to dependence on defensive measures. Preservation treatment of common building carcassing and joinery timbers is relatively inexpensive and consequently, with little consideration of its actual need is frequently specified as a low premium insurance

[Technical data sheet 3 Glulam in fire](#)

The charring rate of timber exposed to fire is predictable. BS 5268:Part 4 sets out the

criteria by which the strength of the residual section may be assessed following specified periods of endurance. This enables designers to ensure that the required fire resistance can be achieved. In practice Glulam beams 90mm thick and over will usually endure a 30-minute fire without modification. Longer periods will probably lead to an increase in thickness although this may be partially offset by a reduction in depth.

[Technical data sheet 4 Solid timber decking](#)

Solid timber decking is a natural choice, with the combined virtues of pleasing appearance, cost effectiveness in use, and structural function. It provides a natural timber ceiling, which spans clear between main structural members. It can be installed quickly and economically by nailing to the building structure. Timber decking has good insulation properties, and secondary fixings are readily attached to it. Proprietary Class 1 Spread of Flame treatments can be also be applied to the decking in-situ but only when the building is, and will remain, dry.

National House Building Council

[Good craftsmanship guide - Carpentry and joinery - carcassing](#)

Highlights key problems with the major elements of carpentry and joinery - carcassing, and gives guidance on how to avoid them. The Guide is based on NHBC Standards.

Nordic Timber Council

[Finger jointed Swedish and Finnish redwood and whitewood](#)

The object of this publication is to explain the types and functions of finger joints and discuss the aspects which are important to designers, specifiers, manufacturers, builders, users and buyers.

TRADA Technology

[Timber in construction / Chapter 8 - Domestic carpentry. \(9 of 15\)](#)

Document History - This is the 1987 reprint. This document is part of a larger document, Timber in Construction, which has been split into parts for ease of use. This book has been prepared by the Timber Research and Development Association as part of its 50th anniversary celebrations. There has long been a need for an authoritative reference book on the use of timbers in construction for architects and specifiers and for students in these fields. This book, with each chapter written by a specialist in the subject, is intended to fill that gap.

[Timber in construction / Chapter 9 - Specifying joinery. \(10 of 15\)](#)

Document History - This is the 1987 reprint. This document is part of a larger document, Timber in Construction, which has been split into parts for ease of use. This book has been prepared by the Timber Research and Development Association as part of its 50th anniversary celebrations. There has long been a need for an authoritative reference book on the use of timbers in construction for architects and specifiers and for students in these fields. This book, with each chapter written by a specialist in the subject, is intended to fill that gap.

[*Timber in construction / Chapter 10 - Design and manufacture of mass production joinery. \(11 of 15\)*](#)

Document History - This is the 1987 reprint. This document is part of a larger document, Timber in Construction, which has been split into parts for ease of use. This book has been prepared by the Timber Research and Development Association as part of its 50th anniversary celebrations. There has long been a need for an authoritative reference book on the use of timbers in construction for architects and specifiers and for students in these fields. This book, with each chapter written by a specialist in the subject, is intended to fill that gap.

[*Timber in construction / Chapter 11 - Design and detail of purpose made joinery. \(12 of 15\)*](#)

Document History - This is the 1987 reprint. This document is part of a larger document, Timber in Construction, which has been split into parts for ease of use. This book has been prepared by the Timber Research and Development Association as part of its 50th anniversary celebrations. There has long been a need for an authoritative reference book on the use of timbers in construction for architects and specifiers and for students in these fields. This book, with each chapter written by a specialist in the subject, is intended to fill that gap.

[*Timber in construction / Chapter 12 - Timber, decorative and practical. \(13 of 15\)*](#)

Document History - This is the 1987 reprint. This document is part of a larger document, Timber in Construction, which has been split into parts for ease of use. This book has been prepared by the Timber Research and Development Association as part of its 50th anniversary celebrations. There has long been a need for an authoritative reference book on the use of timbers in construction for architects and specifiers and for students in these fields. This book, with each chapter written by a specialist in the subject, is intended to fill that gap.

[*Wood Information Sheet 1/33 Performance of joinery products*](#)

This document covers; windows; wood stairs; doors and; possible future requirements.

[*Wood Information Sheet 1/47 Timber external doors*](#)

Covers legislative and performance requirements, timber selection, design considerations, finishing treatments, together with guidance on storage and installation, which can often be critical in the overall performance of the doorset in use.

[*Wood Information Sheet 4/16 Timber in joinery \(Sept 2002 revision\)*](#)

The first section of this information sheet provides an outline of the requirements of BS EN 912. The second section gives more general guidance relating to specifying timber in joinery.