PreCIS Essential list - Steelwork

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 The documents cited were current at the time the selection was made, but may have since been superseded or replaced.
Steel in bridges

British Constructional Steelwork Association

Publication 34/02 Steel bridges. 2nd edition
Document History - Prepared by Cass Hayward and Partners, Alan C G Hayward and Neil Sadler for the BCSA
Gives general guidance on the design of small and medium span steel bridges, in the UK, and provides insights into the practical aspects of fabrication and erection to help designers use steel more efficiently and economically to achieve clients requirements. The text of the 2nd edition has been amended and updated to reflect changes in procurement practice, harmonisation of European standards, technological advances in manufacturing and construction, and the modernisation of fabrication workshops.

Publication 38/05 BCSA Guide to the erection of steel bridges
Document History - Endorsed by the HSE
Covers all aspects of steel bridge projects and can be applied to the common forms of composite and steel-decked construction, for short and medium span road bridges, rail bridges and footbridges.

British Standards Institution

BS 5400-3:2000 Steel, concrete and composite bridges. Code of practice for design of steel bridges (AMD Corrigendum 13200) (AMD 16404) (AMD Corrigendum 16480)
Recommendations for design of structural steelwork in bridges, together with procedures for design of steelwork components, assemblies and connections. Hybrid construction, using materials of different yield stress is not included.

BS 5400-6:1999 Steel, concrete and composite bridges. Specification for materials and workmanship, steel (AMD Corrigendum 13715)
Document History - Supersedes BS 5400-6:1980. Amendment 13715 is Corrigendum No.1

CIRIA

Technical Note TN 110 Residual stresses in a steel box girder bridge
This Technical Note summarises an investigation into the build-up of residual stresses during the construction of the Cleddau steel box girder bridge. Strain measurements were taken on selected plate panels and stiffeners at various stages of fabrication, site assembly and erection. The Note describes the different forms of residual stress and their relevance to box girder construction. A complex pattern of residual stress build-up was found. Stresses in individual plate panels and stiffeners were often substantially higher than average stress levels across a section. This has been put down to the influence of mechanisms of weld shrinkage other than those normally considered, and to the influence of other construction processes, particularly the methods of obtaining good fit-up.
Highways Agency

**DMRB Volume 1 Section 1 Part 1 (BD 2/05) Highway structures: Approval procedures and general design. Approval procedures. Technical approval of highway structures (See also HA IAN 44/05)**

Document History - DMRB 1.1.1. Design manual for roads and bridges (DMRB). See HA Interim Advice Note 44/05 Revision 4 - this details some text changes to be made in Annexes A1 and B1. Updates and supersedes BD 2/02

Specifies the procedures for technical approval for highway structures.

**DMRB Volume 1 Section 3 Part 13 (BA 53/94) Highway structures: Approval procedures and general design. General design. Bracing system and the use of U-frames in steel highway bridges**

Document History - DMRB 1.3.13. Design manual for roads and bridges (DMRB). Old series - DMRB Departmental Advice Notes (Bridges and Structures)

This Advice Note gives guidelines on the design of bracing systems and U-frames for steel and composite highway bridges and footbridges. This Advice Note is applicable to the design and assessment of steel only and steel-concrete composite bridges.

**DMRB Volume 1 Section 3 Part 14 (BD 13/06) Highway structures: Approval procedures and general design. General design. Design of steel bridges. Use of BS 5400-3:2000**


Gives details for using the British Standard as well as additional requirements.

**DMRB Volume 1 Section 3 BA 19/85 Highway structures: Approval procedures and general design. General design. Use of BS 5400: part 3: 1982**

Document History - DMRB 1.3. Design manual for roads and bridges (DMRB). Old series - DMRB Departmental Advice Notes (Bridges and Structures)

**DMRB Volume 1 Section 3 Part 15 (BA 84/02) Highway structures: Approval procedures and general design. General design. Use of stainless steel reinforcement in highway structures**

Document History - DMRB 1.3.15. Design manual for roads and bridges (DMRB). Old series - DMRB Departmental Advice Notes (Bridges and Structures)

Advises on the use of stainless steel reinforcement in reinforced concrete highway structures to provide resistance to chloride attack. Also covers embedded stainless steel bars.

**DMRB Volume 2 Section 2 Part 7 (BD 67/96) Highway structures: Design (substructures and special structures) material. Special structures. Enclosure of bridges**

Document History - DMRB 2.2.7. Design manual for roads and bridges (DMRB). Old series - DMRB Departmental Standards (Bridges and Structures)

An enclosure around bridge deck support steelwork provides an additional method of protecting the steel against corrosion. It reduces the rate of breakdown of the protective coatings to the steel by providing an environment of low corrosivity and reducing direct contact with atmospheric pollutants, leading to a reduction in
This Standard gives the requirements for evaluating and designing enclosures of bridges. It applies when designing enclosures for the structural steel elements below deck level of any type of bridge, whether as a method of reducing future maintenance costs or of improving access, or both. The Standard applies whether the enclosure is designed for an existing bridge or for a new structure.

**DMRB Volume 2 Section 3 Part 8 (BD 7/01)** Highway structures: Design (substructures and special structures) material. Materials and components. Weathering steel for highway structures


Design, construction and in-service maintenance aspects are detailed.

**DMRB Volume 3 Section 2 Part 2 (BD 87/05)** Highway structures: Inspection and maintenance. Maintenance. Maintenance painting of steelwork

Document History - DMRB 3.2.2. Design manual for roads and bridges (DMRB). Old series - DMRB Departmental Standards (Bridges and Structures). Supersedes BD 87/03

Gives requirements and advice for the maintenance painting of steelwork. Also gives guidance for appointment and duties of painting inspection firms.


Guidance is given for selecting and installing cathodic protection systems used for the corrosion protection of reinforcement in highway structures.


Guidance for systematic management of corrugated steel buried structures. Discusses factors affecting durability, advises on inspections for and measurement of defects, maintenance, structural assessment and repair works.

**DMRB Volume 3 Section 3 Part 5 (BA 88/04)** Highway structures: Inspection and maintenance. Repair. Management of buried concrete box structures

Document History - DMRB 3.3.5. Design manual for roads and bridges (DMRB). Old series - DMRB Departmental Advice Notes (Bridges and Structures).

Guidance on the systematic management of buried concrete box structures. Discussing factors affecting durability, advising on inspection for and measurement of defects, maintenance, structural assessment and repair works.
**DMRB Volume 3 Section 4 Part 11 (BD 56/96) Highway structures: Inspection and maintenance. Assessment. Assessment of steel highway bridges and structures**

Document History - DMRB 3.4.11. Design manual for roads and bridges (DMRB). Old series - DMRB Departmental Standards (Bridges and Structures)

This Standard gives requirements for the assessment of existing steel structures and structural elements.

**DMRB Volume 3 Section 4 Part 12 (BA 56/96) Highway structures: Inspection and maintenance. Assessment. Assessment of steel highway bridges and structures**


This Advice Note provides guidance on the use of BD 56 (DMRB 3. 4. 12), The Assessment of Steel Highway Bridges and Structures, and should be used in conjunction with the Standard. The major part of this document is contained in Annex A which is set out in the form of a commentary on Annex A of the Standard. It contains explanations for the main changes from the design code, BS 5400: Part 3: 1982, and gives advice on the interpretation of the assessment requirements. Also included are comments and references which provide additional information appropriate to special situations.

**DMRB Volume 3 Section 4 BE 13 Highway structures: Inspection and maintenance. Assessment. Fatigue risk in Bailey bridges**


**Roads Service**

*Technical approval of highway structures: Information for developers and their designers*

Technical approval is required on structures within or supporting road boundaries to ensure safe use and serviceability. Covers design requirements, categories and proposals and operational procedures.

**Steel Construction Institute**

*Publication 154 Design of steel bridges for durability*

Outlines the aspects of conceptual and detailed design which effect the durability of steel and composite bridges. Information is included on protective coatings, alternatives to coatings, fatigue sensitive components and general good maintenance practice; a useful 'Checklist' is also included. The report will assist bridge designers to make an effective and economic use of steel and keep the 'whole-life' cost of the bridge to a minimum.

*Publication 163 Integral steel bridges design guidance*

This publication provides an introduction to concepts relating to 'integral bridges' and illustrates ways in which the ordinary composite beam-and-slab deck bridge can be adapted to become an integral bridge. Also, the opportunity to use steel in place of reinforced concrete for the supports is explored. Steel piles offer a degree of flexibility at supports that is particularly suited to the movements that occur in an
integrated structure; guidance is included to facilitate the consideration of steel piled substructures.

**Publication 170** Specification of structural steelwork for bridges: A model appendix 18/1 (for use with the Specification for Highway Works) (3rd edition)
Document History - Incorporates modifications to Section 3
A model document containing a series of clauses that may be inserted into a project specification and that will be compatible with the Specification for Highway Works, with BS 5400 part 6, and with the standards for materials and workmanship current at the time of drafting, including those covering such specialist matters as welding, bolting, and protective treatment.

**Publication 180** Integral steel bridges: design of a single span bridge - worked example
Provides a worked example for the design of a single span fully integral bridge, that utilises High Modulus Pile Abutments and a composite plate girder deck. Calculations are provided for each design stage, together with detailed notes explaining the background to the methods employed and the parameters chosen. A design is proposed for a reinforced capping beam to provide a full moment connection between the high modulus piles and the deck. Information is based on the findings of studies undertaken on steel integral bridges and steel substructures by the SCI since 1993.

**Publication 185** Steel Bridge Group: Guidance notes on best practice in steel bridge construction. Third issue | Section 0 - Contents and introduction. (1 of 10)
Document History - This document is part of a larger document, Steel Bridge Group: Guidance notes on best practice in steel bridge construction. 3rd issue, which has been split into parts for ease of use.
This publication presents a collection of separate Guidance Notes on a range of topics concerning the design and construction of structural steelwork for bridges. Each note is based on an original draft by a member of the Steel Bridge Group, and subsequently developed with assistance and comment from other SBG members. The first issue contained 31 notes. The second issue included a further 18 notes, and revisions of three of the earlier notes. This third issue contains a further 11 new guidance notes, 2 revised notes, preliminary pages and contents pages for individual sections.

**Publication 185** Steel Bridge Group: Guidance notes on best practice in steel bridge construction. Third issue | Section 1 - Design (General). (2 of 10)
Document History - This document is part of a larger document, Steel Bridge Group: Guidance notes on best practice in steel bridge construction. 3rd issue, which has been split into parts for ease of use.
This publication presents a collection of separate Guidance Notes on a range of topics concerning the design and construction of structural steelwork for bridges. Each note is based on an original draft by a member of the Steel Bridge Group, and subsequently developed with assistance and comment from other SBG members. The first issue contained 31 notes. The second issue included a further 18 notes, and revisions of three of the earlier notes. This third issue contains a further 11 new guidance notes, 2 revised notes, preliminary pages and contents pages for individual sections.

**Publication 185** Steel Bridge Group: Guidance notes on best practice in steel bridge construction. Third issue | Section 2 - Design (Detailing). (3 of 10)
three of the earlier notes. This third issue contains a further 11 new guidance notes, 2 revised notes, preliminary pages and contents pages for individual sections.

**Publication 241 Durability of steel bridges: a survey of the performance of protective coatings**
The purpose of this report is to present views and findings about the durability of corrosion protection systems applied to primary structural members of bridge steelwork. It presents the results of an independent survey into the performance of protective coating systems for bridge steelwork.

**Publication 250 Integral steel bridges: design of a multi-span bridge - worked example**
This publication investigates the use of steel piling as an alternative to conventional reinforced concrete supports for multi span integral bridges, and proposes a number of design options to meet the durability criteria of BD 57

**Publication 295 Commentary on BS 5400-3: 2000 Code of practice for the design of steel bridges**
Document History - Replaces P085
Discusses in detail, on a clause-by-clause basis, those aspects of BS 5400-3 (as recently and extensively amended) that are the most commonly used by bridge designers.

**Publication 340 Integral steel bridges: a summary of current practice in design and construction**
Identifies the three principal configurations that are most commonly chosen and presents data about the numbers and types of steel highway bridge that have been built in the period since 2000. For each of the three configurations, the form of construction of the end supports are described and illustrated, and the particular design and construction issues are discussed.

**Transport Research Laboratory**

**Contractor Report 19 Use of high strength friction grip bolted connections in bridge steelwork**

**Contractor Report 71 Brittle fracture in steel bridges**
Investigates the background and applicability of the current requirements for avoidance of brittle fracture in welded steel bridges, and compares them with requirements in other countries.

**Laboratory Report 839 Reappraisal of ambient conditions satisfactory for site painting of steel bridges**

**Laboratory Report 857 Corrosion performance of weathering steel in highway bridges**

**Report 472 Forth Road Bridge: temperature measurements**
Report 546 Intelligent monitoring of jack arch structures
Provides and discusses the results of a load test conducted on a cast iron beam instrumented with strain gauges, deflection gauges, and acoustic emission (AE) systems obtained from Physical Acoustics Ltd and from Pure Technology (their ‘SoundPrint’ system). The beam was recovered from a jack arch bridge constructed in 1852 and demolished in the late 1980s. The report provides information on the properties of cast iron and details of jack arch structures.

Research Report 233 Corrosion of weathering steel under real and simulated bridge decks
Long term corrosion tests have been carried out on Cor-Ten B weathering steel and mild steel at a number of locations in the UK. Test specimens were exposed under open and sheltered conditions on both real and simulated bridge decks. In some cases the test specimens were in close thermal contract with the bridge girders to check that small test specimens do give corrosion rate measurements representative of the steel in large structures. The results showed that small test specimens do provide relevant information and confirmed differences between corrosion under sheltered and open exposure conditions. Cor-Ten B corroded at a generally lower rate than mild steel but the difference was reduced under sheltered conditions. Sheltered marine environments led to high corrosion rates with localised corrosion and pitting and there were indications that similar problems might develop on overbridges subject to traffic spray sometimes containing salt from de-icing operations. However more information would be needed on the performance of weathering steel in such locations to specify acceptable levels of exposure to spray and chlorides.

Research Report 276 Assessment of trough to crossbeam connections in orthotropic steel bridge
Fatigue cracks in early designs of trough to crossbeam connection in orthotropic steel bridge decks have occurred after less than 20 years service. The objectives of this research were to assess the fatigue performance of more recent designs of connection and, if appropriate, to suggest design improvements. It is concluded that none of the three designs tested, and currently in use in major European bridges, meet the 120 year design life of UK bridges when assessed by the BS 5400 Code of Practice for Fatigue, ignoring the effect on the bridge deck surfacing. An 'optimised' design is suggested but will require a similar testing programme to assess its performance before being adopted for use in practice.

Supplementary Report 353 Strength of stiffened box girder diaphragms
This report contains the results of a study into the relationship between strength, geometry and imperfections.

Steel building systems/frame

Architects' Journal

Multi-storey masonry. AJ 07.11.96
Refurbishment of Winterton House, tower block in Tower Hamlets, involved stripping back to the steel frame, which was unable to support the new, heavier concrete floors and proposed brickwork cladding. An independent, self-supporting masonry wall was constructed outside the frame and a steel truss transfer structure
used to connect the tops of the masonry and frame. Jacking against the transfer structure was used to apply tension to the frame and compression to the brickwork.

Architects: Hunt Thompson

*Taper beams for long office spans. AJ 1.10.86.*

*Developments in steel construction. AJ 29.6.94*

*Surebuild - a new kind of kit house. AJ 30.5.96*

Describes Surebuild - a panel system that uses cold-rolled steel framing.

*It's a steel. AJ 01/08.08.2002*

Steel framed prefabricated housing project at Oakridge Central.

*Special report: Building with steel. AJ 15.994*


A new guide 'Appraisal of existing iron and steel structures' explains the appraisal and reuse of iron and steel building frames from the late 1700's to the 1960's. It is both an historical study and a working guide.

*Architects' Journal Technical Steel in the frame. AJ 03.07.97.*

A round up of recent developments in steel's fire and environmental performance, steel construction systems and composite panels.

*Architects' Journal Technical Special report: steel. The complex geometry of a millennium greenhouse relied on the design team's cohesion as much as the steel fixings. AJ 3/10.08.2000*

*Architects' Journal Technical Steel marches on. AJ 23.01.97*

New developments in structural steel, including parallel flange sections, Slimflor flooring composite construction, fire protection systems. Reports work on embodied energy aspects of steel and its recycling costs.

*Architects' Journal Technical Spain celebrates a world of steel. AJ 02.7.98*

*Architects' Journal Structural Developments 5. Steel or concrete. AJ 22.5.91*

*Architects' Journal Structural Developments 1. Steel frame design. AJ 24.4.91*

*Architects' Journal Structural Developments 2. Steel frame buildings. AJ 1.5.91*

*Architects' Journal Building Study Devonshire cream. Redevelopment of a former BT site in the City of London. AJ 28.03.2002*

Includes costs and working details of a facade with an exposed structural steel frame.


Includes costs and working details of an independent steel structure within a stone shell pavilion.
Includes working details of a facade of self-supporting precast panels.

Architects' Journal Building Study Where size is everything. AJ 09.7.98
New, fast-track factory and offices for Cummins Engine Company in Kent, designed for flexibility. Steel structure comprises tree-like columns with cantilever arms supporting the roof. Concrete ground-bearing slab was laid using large bay techniques and laser screeding technology; a cement-based, dry-shake topping was applied and polished as a finish. Natural ventilation and smoke control are assisted by roof vents. Office area has full height glazing, with fire screen separating it from the factory. Working details of tree columns.

Architects' Journal Building Study New facade on an original frame. Swan House, Old Bond St, London. AJ 3.2.93
Reinstatement of Portland stone facade on Swan House, and building transformed into offices and shops. Architects: Hawkins Brown


Architects' Journal Working Details Touch of glass. AJ 27.11.97
Working details of the Bar Rouge Cafe, Brindleyplace, Birmingham, which is designed to allow customers to spill outdoors. The glass and steel structure, a series of portal frames, has butterfly wing canopies which extend over the roof. Canopies are made of fritted glass to reduce solar gain; the walls are of clear glass with fritted horizontal signs. Gives details of fixing of facade to structure.

Architects' Journal Working Details Steel structure with 'tree' columns. AJ 09.7.98

Architects' Journal Working Details Exposed steel building with cantilevered 'pods'. AJ 22.4.04
Relates to Hodder Associate's new swimming pool, located in Grange-over-Sands, Cumbria.

The HQ offices of the Image Bank have been transformed by an insect-like glass and steel courtyard structure

Architects' Journal Working Details Suspended steel staircase and fabric screen. AJ 20/27.8.98

Architects' Journal Working Details Structure: station. AJ 8.4.92

Association for Specialist Fire Protection

Fire protection for structural steel in buildings

Fire protection for structural steel in buildings (2nd edition - revised, 1992). (No longer current but cited in the Building Regulations)

Document History - No longer current but cited in the Building Regulations.
Superseded by the 2nd revision of the 2nd edition 2000

Presents economical methods for the fire protection of structural steel to provide compliance with Building Regulations with a comprehensive guide to proprietary materials and systems, all of which are manufactured, marketed or site applied by members of ASFPCM. Also contains specifications of generically described materials, the use of which is traditional. The details are presented in a methodical arrangement from which a specifier can readily obtain the data required to provide a given period of fire protection to steel members of various sizes and weights

Supplement to 2nd edition (revised) Fire protection for structural steel in buildings. (No longer current but cited in the Building Regulations)

Document History - This supplement to the 1st revision of the 2nd edition is no longer current, it has been incorporated into the 2nd revised edition of the 2nd edition.

The purpose of this supplement is to provide the specifier and end user with an update of new and improved materials introduced since the publication of the second edition.

Technical Guidance Note 002 Spray coatings for the fire protection of structural steel. Part 1: Technical guidance note for the mechanical retention of sprayed mineral coatings based upon the requirements of BS 8202: Part 1:1993

The recommendations made in this guidance note are based on BS 8202: Part 1: 1993 for the sprayed application of lightweight mineral coatings which may, or may not, require mechanical retention for the fire protection of structural steel elements of construction.

Technical Guidance Note 003: P1 On site measurement of intumescent coatings - Part 1 Technical Guidance Note for the measurement of dry film thickness (dft's) for intumescent coatings

This document gives practical guidance in the selection of instrumentation, its calibration and use in measuring the applied thicknesses of an intumescent coating system used to impart fire resistance to elements of structure and the correct interpretation of such data.

Technical Guidance Note 004 Fire protection of roof components of portal framed buildings and secondary structural steelwork

This report combines and reviews the comments made in two previous reports with respect to the current provisions of Approved Document B of the Building Regulations 1991. Report C42430 made comments concerning the protection of the roof supporting components of steel portal frames used in single storey buildings. Report C52047 made comments concerning the need for the protection of lightweight steel tees, angles and bracing members against the effects of fire.
British Board of Agreement

**Building System Agreement Certificate 86/S012** British Steel Framing PLC. Surebuild housing system. Third issue
For use in the construction of single- and two-storey detached, semi-detached or terraced houses in areas of the United Kingdom, and required to have a minimum design life of 60 years.

**Building System Agreement Certificate 86/S013** CLASP Development Group. CLASP system of building. Second issue
This certificate relates to the CLASP system of building.

The system is a steel frame for use as a single-, two- and three-storey residential accommodation, dwellings, shops, restaurants, commercial buildings and offices.

**Building System Agreement Certificate 01/S027** Fleming Group Holdings Ltd. Fusion steel frame housing system
Steel frame housing system for use in the United Kingdom for: detached, semi-detached and terraced dwellings up to two storeys, and dwellings required to have a minimum design life of 60 years.

**Building System Agreement Certificate 02/S028** Britspace Modular Building Systems Ltd. Britspace housing system (steel frame)
A steel frame for use as single-, two-, three- and four-storey dwellings and flats which, when built in accordance with current building regulations, have adequate strength and stability and has a design life of at least 60 years.

**Building System Agreement Certificate 04/S035** Yorkon Ltd. Yorkon room module building system. 2nd issue
Relates to the structural performance of the Yorkon room module building system. It is designed to be used in dwellings, institutional and other residential accommodation up to four storeys in height and can be used to construct buildings with a variety of individual treatments and plan forms.

**Building System Agreement Certificate 04/S036** Stanta Ltd. Stanta light steel frame system
Relates to the Stanta light steel frame system, which is a building system based on a range of factory-made panels. It is to be used in the construction of dwellings, institutional and other residential accommodation up to four storeys in height and can be used to construct buildings with a variety of individual treatments and plan forms. Includes detail sheets: (2) Stanta light steel frame system with masonry outer leaf, and Irish building regulations statement.

**Building System Agreement Certificate 05/S037** Vencel Resil Ltd. Jabhouse Building System
Relates to the Jabhouse building system, a panelised method of construction using wall elements of structural insulated panels manufactured from OSB/3 and EPS insulation. The system is designed to be used in single or multiple occupancy
constructions in buildings up to two storeys plus room-in-roof or three storeys with trussed roof. The panels may be used as loadbearing or non-loadbearing elements.

Building System Agreement Certificate 06/S039 Innovare Systems Ltd. Innovare Jabhouse building system
Relates to the Innovare Jabhouse building system, a panelised method of construction using wall elements of structural insulated panels manufactured from OSB/3 and EPS insulation. The system is designed to be used in single or multiple occupancy constructions in buildings up to two storeys plus room-in-roof or three storeys with trussed roof. The panels may be used as loadbearing or non-loadbearing elements.

British Constructional Steelwork Association

Guidance notes: safer erection of steel-framed buildings
The objective of this document is to provide steelwork contractors with statements of good practice on health and safety issues, and to demonstrate that structural steelwork erection can be inherently safe provided due cognisance and consideration are given to these issues.

Publication 11/84 Historical structural steelwork handbook
Tables and notes on properties of UK and European cast iron, wrought iron and steel sections including design, load and stress data since the mid 19th century. It has been necessary to condense a great deal of technical information to make this document manageable. It can be assumed, then, that recommendations regarding material qualities, sizes etc are representative rather than inflexible.

Publication 13/84 Multi-storey steel structures: a study on performance criteria
A study by the ECCS Multi-storey buildings committee into the deformations of steel structures due to gravity loadings and temperature effects.

Publication 16/93 Erector's manual (2nd ed.)
This publication has been written with the objective of assisting all individuals who have to visit or work on a construction site by providing safe and efficient procedures.

Publication 25/01 Health and safety in the workshop: a guide for steelwork contractors (2nd ed.)
This booklet has been produced to help the reader to understand the various health and safety rules and procedures which apply to workshops.

Publication 27/01 Health and safety on site: a guide for steelwork contractors
This booklet has been produced to help the reader to understand the various health and safety rules and procedures which apply to construction sites.

Publication 29/01 Health and safety guide for managers and supervisors
Managers and supervisors have a specific legal duty to ensure appropriate health and safety laws applicable to the workplace are implemented effectively. This booklet has therefore been written specifically for managers and supervisors within the steelwork contracting industry.
**Publication 32/01** Contractual handbook. 3rd edition
There have been considerable developments in case law since the second edition, which have affected the position of steelwork and other specialist contractors. This edition covers: Formation, Classes, and Standard forms of contracts, Contract clauses, Certificates, Set off and payment, Fluctuations, Variations, Extensions of time, Cost of delay, Claims, Liability, Supply of goods, Limitation periods, Insurance, Bonds and guarantees, Disputes, Insolvency, JCT form of contract with contractors design, Scottish forms of contract, Nomination, Competition law and Amendments to standard forms.

**Publication 33/02** Financial handbook for steelwork contractors
Aims to give companies a better understanding of their finances overall and the profitability of individual contracts in particular. Intended to improve competition in the marketplace, and to reduce the largest cause of low profitability: low tenders.

**Publication 203/02** National structural steelwork specification for building construction. 4th edition
Document History - Published in association with the Steel Construction Institute
This specification deals with structural steelwork designed in accordance with BS 5950-1 and Eurocode 3 Part 1.1 (DD ENV 1993-1.1). It can be used for all types of building construction designed for static loading.

**Publication 35/03** Steel buildings
Covers all aspects of steel design: section property tables, industrial and multi-storey buildings, connection, cladding and decking, steel qualities, steel sections and plate, welding and bolting, fabrication, corrosion protection, fire, transport and erection, health and safety, software, contract and payment, sustainability, historical development of steel construction and project case studies.

**Publication 209/03** Commentary on the 4th edition of the national structural steelwork specification for building construction.
Document History - Joint publication with the Steel Construction Institute.
The National Structural Steelwork Specification for Building Construction provides documentation which can be included in a steelwork contract, and which helps to ensure that steelwork is accurately and economically made and can be safely built. This commentary aims to give guidance and information on the specification document and on the philosophy behind it.

**Publication 37/04** BCSA Code of practice for metal decking and stud welding
Document History - Endorsed by the HSE
Offers best practice guidance for sites where metal decking and associated components are being installed and in particular aims to improve health and safety. Covers aspects of competence and supervision, training and qualifications, briefing and inductions, planning, weather, method statements, risk assessments. It also looks at design issues, manufacture and delivery, site arrangements, site practice, tools and equipment, installation, stud welding and completion.

**Publication 41/05** Steel details
Compiles a number of articles suggesting practical advice on the issues that affect the efficient detailing of steelwork connections. Some, which consider connection
detailing, cost, simple design and basic fabrication, advise on how to create practical structures. Others provide insight into connection behaviour and the ongoing developments in ‘green books’. Developments in specialist areas of steelwork design and details like bridgework, hollow section joints, tension connections, towers and masts and the structural fasteners are discussed.

**Publication 39/05 BCSA Guide to steel erection in windy conditions**
Discusses the issues that should be considered when designing for the part-erected condition. Applies to steel-framed buildings up to ten storeys. Additional consideration may be needed for specially-rigged complex lifts, tall structures and sites expecting extreme weather conditions. It is likely these sites would benefit from a study of the effects of wind on erection tasks.

**Publication 42/06 BCSA Code of practice for erection of multi-storey buildings**
Document History - Endorsed by the HSE.
Describes the management procedures and methods to be adopted and is intended to serve as a standard reference when drafting site- and project-specific Erection Method Statements. Contains advice on the safety aspects of site management; site preparation; delivery, stacking and storage of materials; structural stability; holding down and locating arrangements for columns; lifting and handling; and interconnection of components. The principles included also apply to high-rise structures generally.

**Brick Development Association**

**Design Guide 18 Brick cladding to steel framed buildings**
The aim of this publication is to provide guidance to architects, engineers and technicians with illustrations of modern practice combining steel frames and brickwork cladding in non-domestic buildings to achieve stability, durability, buildability and long-term serviceability.

**Engineers File Note 2 Brick cladding to a steel framed building: a different approach**
Usually when cladding a frame with brickwork the outer leaf is supported at one or two storey intervals. The soft joint beneath the shelf angle support accommodates the vertical movement in the cladding. But this solution results in the heavy cladding being supported by the frame. This Note describes a different approach where the brickwork is self supporting over the full five storeys.

**BRE Certification**

**Certificate 102/03 Fusion building system**
Document History - See also building certificates published by WIMLAS.
A steel frame for use in permanent dwellings (in terraced, semi detached or detached formats, and flats) up to four storeys in height. The steel frames are self supporting superstructures and can be designed to carry the dead, imposed and wind loads.

**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.

Certificate 109/03 Advance housing hybrid system. 1st reissue
Document History - See also building certificates published by WIMLAS. A prefabricated light steel frame housing system for use in domestic, single occupancy, dwellings of two storey or three storey (room in the roof) construction. The light steel frames are self-supporting superstructures and are designed to carry all the dead, imposed and wind loads.

Certificate 110/04 Metaframe/SFS building system
Document History - See also building certificates published by WIMLAS. For use in the construction of residential and commercial buildings, assessed for the following performance characteristics: Thermal transmittance and condensation risk, Acoustic performance, Behaviour in relation to fire, Weathertightness, and Durability

Certificate 116/05 4 storey Spaceover building system
Document History - See also building certificates published by WIMLAS. The Spaceover Building System has been assessed to confirm, within limitations, its suitability for use in the construction of residential, multi-occupancy accommodation. This certificate covers buildings up to four storeys in height located within urban city environments in England and Wales. The Spaceover Building System is a volumetric modular method of construction comprising of pre-fabricated light gauge cold rolled steel frame components, and specific dry lining and insulation materials.

Certificate 117/06 Dryform light steel frame building system
Document History - See also building certificates published by WIMLAS. The Dryform Light Steel Frame (LSF) Building System has been assessed to confirm, within limitations, its suitability as a prefabricated light steel frame system for use in constructions up to three storeys high for single or multi occupancy residential buildings with a variety of floor plans.

BRE

Digest 465 U-values for light steel frame construction
Gives a method for assessing U-values of light steel-frame constructions. The method has been validated using the procedures in BS EN ISO 10211-1 and enables U-values to be calculated by means of a simplified method. It is similar to the one given in BS EN ISO 6946 but with some important differences. It can easily be incorporated into software tools used by designers, builders and enforcers of the Building Regulations wishing to calculate U-values of light steel-frame constructions. The method was developed jointly by BRE and The Steel Construction Institute.

FB 5 New fire design method for steel frames with composite floor slabs
Document History - Published by the BRE for the Foundation for the Built Environment now known as the BRE Trust. FBE Report 5
Explains how fire tests have shown that actual steel-framed buildings perform far better under fire conditions than suggested under current structural fire design methods (based on the results from tests on isolated members). Identifies enhanced performance as the result of membrane action in the composite floor slab. The
derivation of a design method that incorporates this is described, supported by design charts and worked examples.

**Information Paper 14/87 Inspecting steel houses**
This Information Paper summarises a BRE Report 'Steel Framed and Steel Clad Houses: Inspection and Assessment'. It identifies locations where steel is vulnerable to corrosion, and gives outline advice on the likely integrity and future durability of protection systems which might be encountered, and the rate at which unprotected steel might corrode in the future. Most corrosion encountered so far in the inspections has been of a superficial nature. However, there are a few dwellings where corrosion in particular parts of the construction is more advanced. Corroded rolled steel, where it occurs, is relatively easy to cut away and replace with standard sections.

**Information Paper 15/87 Maintaining and improving steel houses**
BRE is currently examining the condition of steel framed and steel clad houses, some of which are undergoing repairs or improvement. The paper describes briefly some of the key points in specifying and carrying out maintenance, repair and improvement works: brief advice on good practice is given. A more comprehensive report will be published when further site studies have been completed.

**Information Paper 3/06 Part 1 Reinforced concrete service life design. Overview**
Provides an overview of a service life design system developed by BRE for reinforced concrete structures. This system can be used to assist structural designers in meeting clients' requirements for service life, functionality and maintenance. Includes best practice guidance for undertaking a client brief designing for durability and effective execution and maintenance. The guidance is combined with the output from specialised models for concrete deterioration to provide a holistic service life design system.

**Information Paper 3/06 Part 2 Reinforced concrete service life design. Design for durability**
Discusses the detailed design stage, starting with existing best practice for the specification of durable concrete, derived from structural requirements taken from design codes and general requirements for durable concrete taken from standards and other publications. Considers detailing for longer service life and maintaining quality on site, and briefly mentions extra measures to enhance service life, such as multilayer protection against chemical attack.

**Information Paper 3/06 Part 3 Reinforced concrete service life design. Service life forecasting and enhancement**
Provides guidance on forecasting the service life of reinforced concrete structures and components at the design stage, and describes methods available to enhance service life where required. In order to provide a relatively simple approach to forecasting, the BRE service life design system uses a version of the factorial method used in BS ISO 15686-1.

**Report 77 British Iron and Steel Federation steel framed house**
This report records the form of construction of BISF houses and identifies locations within the structure where deterioration of structural and non-structural elements has occurred.
Report 78 Howard steel framed houses
This note records the form of construction of Howard Houses and identifies locations within the structure where deterioration of structural and non-structural elements have occurred.

Report 110 Dorlonco steel framed houses
This report records the form of construction of Dorlonco houses and identifies locations within the structure where deterioration of structural and non-structural elements has occurred.

Report 113 Steel framed and steel clad houses: inspection and assessment
This report, addressed to local authority and private sector surveyors, describes in general terms the methods of inspection and assessment of the steel content of steel framed and steel clad houses (and cast iron houses) required to produce a 'structural survey'. The report, based largely on recent BRE survey work, identifies locations where steel is vulnerable to corrosion, and gives outline advice on the likely integrity and future durability of protection systems which might be encountered, and the rate at which unprotected steel might corrode in the future. The report concludes that most corrosion encountered so far in the inspections has been of a superficial nature. However, there are a few dwellings where corrosion in particular parts of the construction is more advanced. Corroded rolled steel, where it occurs, is relatively easy to cut away and replace with standard sections. The majority of steel houses are expected to give good performance into the foreseeable future, and should have a life on a par with rehabilitated dwellings in conventional construction.

Report 119 Roften steel framed houses
This report records the form of construction of Roften dwellings, identifies locations within the structure where deterioration has occurred, and highlights areas where surveyors should pay particular attention when making an inspection.

Report 120 Dennis-Wild steel framed houses
This report records the form of construction of Dennis-Wild dwellings, identifies positions where deterioration of structural and non-structural elements has occurred, and highlights areas where surveyors should pay particular attention when carrying out an inspection.

Report 132 Cussins steel framed houses
This report records the form of construction of Cussins houses, identifies locations within the structure where deterioration has occurred and highlights areas where surveyors should pay particular attention when carrying out an inspection.

Report 133 Livett-Cartwright steel framed houses
This report records the form of construction of Livett-Cartwright steel framed houses,
identifies locations within the structure where deterioration has occurred and highlights areas where surveyors should pay particular attention when carrying out an inspection.

**Report 139 Cruden Rural steel-framed houses**
This report records the form of construction of Cruden rural houses, identifies locations within the structure where deterioration has occurred and highlights areas where surveyors should pay particular attention when making an inspection. This type of house was built only in Scotland. This report gives the results of a survey of the forms of construction and the condition of steel-framed and steel-clad houses.

**Report 142 Use of light-gauge cold-formed steelwork in construction: developments in research and design**
This report examines the developments in research and design of light-gauge cold-formed steelwork used in the construction industry, and reviews the application of these new developments in preparing national and international design standards.

**Report 144 Falkiner-Nuttall steel-framed houses**
The purpose of this report is to record the information currently available about Falkiner-Nuttall steel-framed dwellings. It describes the form of construction and the condition of the structural components. The information has been gained from examination of two dwellings and is intended to assist owners and building surveyors in making an inspection and assessment of these properties.

**Report 145 Crane steel-framed bungalows**

**Report 146 Trusteel MkII steel-framed houses**
This report records the form of construction of Trusteel MkII-type dwellings, identifies positions where deterioration has occurred, and highlights areas where surveyors should pay particular attention when carrying out an inspection.

**Report 147 Trusteel 3M steel-framed houses**
This report records the form of construction of Trusteel 3M type dwellings, identifies positions where deterioration has occurred, and highlights areas where surveyors should pay particular attention when carrying out an inspection.

**Report 148 Atholl steel-framed, steel clad houses**
This report records the form of construction of Atholl steel-framed and steel-clad dwellings, identifies positions where deterioration has occurred and highlights areas where surveyors should pay particular attention when carrying out an inspection. It considers both the Atholl 1920s dwellings and the Atholl 1940s dwellings.

**Report 149 Dorlonco steel framed houses: supplement to the 1987 report**
This supplementary report leaflet describes the major variations to the construction of Dorlonco steel framed houses of which BRE is now aware. It identifies locations within the structure where deterioration has occurred and highlights areas where surveyors should pay particular attention when carrying out an inspection.

**Report 152 Hawthorn Leslie steel-framed houses**
This report records the form of construction of Hawthorn Leslie dwellings, identifies positions where deterioration has occurred and highlights areas where surveyors should pay particular attention when carrying out an inspection.

**Report 163 Nissen-Petren steel framed houses**

**Report 188 Lowton-Cubitt steel-framed houses**
This report records the form of construction of Lowton-Cubitt dwellings, identifies positions where deterioration has occurred, and highlights areas where surveyors should pay particular attention when carrying out an inspection.

**Report 189 Telford steel-clad houses**
The purpose of this report is to record the information currently available about Telford steel-clad houses. It describes the form of construction and the condition of the structural components. The information has been gained from examination of four dwellings on three sites and from available literature, and it is intended to assist owners and building surveyors in making an inspection and assessment of these properties.

**Report 193 Cranwell steel-framed houses**
This report records the form of construction of Cranwell dwellings, identifies positions where deterioration has occurred, and highlights areas where surveyors should pay particular attention when carrying out an inspection.

**Report 196 Birmingham Corporation steel-framed houses**

**Report 197 Hills Presweld steel-framed houses**
This report records the form of construction of Hills Presweld dwellings, identifies positions where deterioration has occurred, and highlights areas where surveyors should pay particular attention when carrying out an inspection.

**Report 198 Arcal steel-framed houses**
This report records the form of construction of Arcal dwellings, identifies positions where deterioration has occurred, and highlights areas where surveyors should pay particular attention when carrying out an inspection.
**Report 199 Homeville Industrialised steel-framed houses**  
This report records the form of construction of Homeville Industrialised dwellings, identifies positions where deterioration has occurred, and highlights areas where surveyors should pay particular attention when carrying out an inspection.

**Report 200 5M steel-framed houses**  
This report records the form of construction of 5M dwellings, identifies positions where deterioration has occurred, and highlights areas where surveyors should pay particular attention when carrying out an inspection.

**Report 201 Arrowhead steel-framed houses**  
The purpose of this report is to record the information currently available about Arrowhead steel-framed dwellings. It describes the form of construction and the condition of the structural components. The information has been gained from the examination of two dwellings in different locations and from available literature, and is intended to assist owners and building surveyors in making an inspection and assessment of these properties.

**Report 202 British Housing steel-framed houses**  
The purpose of this report is to record the information currently available about British Housing steel-framed dwellings. It describes the form of construction and the condition of the structural components. The information has been gained from the examination of one dwelling and from the available literature, and is intended to assist owners and building surveyors in making an inspection and assessment of these properties.

**Report 203 Keyhouse Unibuilt steel-framed houses**  
The purpose of this report is to record the information currently available about Keyhouse Unibuilt steel-framed dwellings. It describes the form of construction and the condition of the structural components. The information has been gained from the examination of one dwelling and from the available literature, and is intended to assist owners and building surveyors in making an inspection and assessment of these properties.

**Report 204 Open System Building steel-framed houses**  
The purpose of this report is to record the information currently available about Open System Building steel-framed dwellings. It describes the form of construction and condition of the structural components. The information has been gained from the examination of two dwellings in different locations and from the available literature, and is intended to assist owners and building surveyors in making an inspection and assessment of these properties.

**Report 205 Steane steel-framed houses**  
The purpose of this report is to record the information currently available about Steane steel-framed dwellings. It describes the form of construction and condition of the structural components. The information has been gained from the examination of two dwellings in different locations and from available literature, and is intended to assist owners and building surveyors in making an inspection and assessment of these properties.

**Report 217 Cowieson steel-clad houses**
Document History - Included in BRE Report 469 - Non traditional houses. The purpose of this report is to record the information currently available about Cowieson steel-clad dwellings. It describes the form of construction and condition of the structural components. The information has been gained from examination of dwellings on two sites and is intended to assist owners and building surveyors in making an inspection and assessment of these properties.

**Report 218 Weir steel-clad (1920s) houses**
This report records the form of construction of the Weir steel-clad dwellings built in the 1920s, identifies positions where deterioration has occurred, and highlights areas where surveyors should pay particular attention when carrying out an inspection.

**Report 219 Stuart steel-framed houses**
Document History - Included in BRE Report 469 - Non traditional houses. This report records the form of construction of Stuart steel-framed dwellings, identifies positions where deterioration has occurred, and highlights areas where surveyors should pay particular attention when carrying out an inspection.

**Report 221 Riley steel-framed houses**
Document History - Included in BRE Report 469 - Non traditional houses. The purpose of this report is to record the information currently available about Riley steel-framed dwellings. It describes the form of construction and the condition of the structural components. The information has been gained from the examination of one dwelling and is intended to assist owners and building surveyors in making an inspection and assessment of these properties.

**Report 222 Coventry Corporation steel-framed houses**
Document History - Included in BRE Report 469 - Non traditional houses. The purpose of this report is to record the information currently available about Coventry Corporation steel-framed dwellings. It describes the form of construction and the condition of the structural components. The information has been gained from the examination of a pair of dwellings and is intended to assist owners and building surveyors in making an inspection and assessment of these properties.

**Report 242 Worked examples for the design of steel structures**

**British Standards Institution**
Deals with the use in building of hot rolled sections, plates and normalized tubular shapes, the steel of which complies with the requirements of BS 4360.

BS 5950-1:2000 Structural use of steelwork in building. Code of practice for design - Rolled and welded sections (AMD Corrigendum 13199)
Document History - Supersedes BS 5950-1:1990. Amendment 13199 is Corrigendum No. 1
Gives recommendations for the design of structural steelwork using hot rolled steel sections, flats, plates, hot finished structural hollow sections and cold formed structural hollow sections, in buildings and allied structures not specifically covered by other standards.

BS 5950-2:2001 Structural use of steelwork in building. Specification for materials, fabrication and erection - Rolled and welded sections
Document History - Supersedes BS 5950-2:1992
Specifies requirements for the materials, fabrication and erection of structural steelwork in buildings subject primarily to static loading, using rolled and welded sections.

This section of BS 5950 gives recommendations for the design of simply supported and continuous composite beams, comprising hot rolled steel sections, plate girders and hollow sections acting compositely with reinforced slab, or with a composite slab complying with BS 5950-4.

BS 5950-4:1994 Structural use of steelwork in building. Code of practice for design of composite slabs with profiled steel sheeting
Document History - Supersedes BS 5950-4:1982
Covers slabs spanning only in the direction of span of the profiled steel sheeting.

BS 5950-5:1998 Structural use of steelwork in building. Code of practice for design of cold formed thin gauge sections (AMD 16502)
Gives recommendations for the design of cold formed steel sections in simple and continuous construction and its provisions apply to the majority of structures.

BS 5950-6:1995 Structural use of steelwork in building. Code of practice for design of light gauge profiled steel sheeting (AMD 10239) (AMD 10475)
Gives recommendations for design of light gauge profiled steel sheeting used as roof decking, flooring and roof and wall cladding. Includes design of profiled steel sheeting as permanent formwork for composite slabs.

BS 5950-7:1992 Structural use of steelwork in building. Specification for material and workmanship: cold formed sections (Obsolescent but remains current and is cited in Building Regulations)
Document History - Declared obsolescent but remains current and is cited in Building Regulations. Will ultimately be superseded by BS EN 1090 Requirements for materials, fabrication and erection, using cold formed steel, of structural steelwork in building.

**BS 5950-8:2003 Structural use of steelwork in building. Code of practice for fire resistant design**
Document History - Supersedes BS 5950-8:1990. Recommendations are given for steel beams, columns and tension members, steel/concrete composite beams, concrete-filled steel hollow sections and composite floors. Also gives recommendations for loads, insulation performance and fire exposure. These fire resistance recommendations are based on standard fire tests and calculations.

**BS 7608:1993 Code of practice for fatigue design and assessment of steel structures (AMD 8337)**
General recommendations for parts of structures which are subject to repeated fluctuations of stress. Covers wrought structural steel with yield strength up to 700 Newtons per square millimetre operating in sub-creep regime.


**BS EN 1993-1.9:2005 Eurocode 3: Design of steel structures. Fatigue (AMD Corrigendum 16292) (AMD Corrigendum 16570)**
BS EN 1993-1.10:2005  Eurocode 3: Design of steel structures. Material toughness and through-thickness properties (AMD Corrigendum 16293) (AMD Corrigendum 16569)
Contains design guidance for the selection of steel for fracture toughness and for through thickness properties of welded elements where there is a significant risk of lamellar tearing during fabrication.

Document History - To enable EN 1994-1.2 to be used in the UK, the nationally determined parameters (NDPs) will be published in a national annex, which will be made available by BSI in due course, after public consultation has taken place.
Deals with the design of composite steel and concrete structures for the accidental situation of fire exposure

Document History - Supersedes DD ENV 1994-2:2001. To enable EN 1994-2 to be used in the UK, the nationally determined parameters (NDPs) will be published in a national annex, which will be made available by BSI in due course, after public consultation has taken place.
Concerned only with requirements for resistance, serviceability, durability and fire resistance of composite structures.

Document History - This document is not to be regarded as a British Standard.
Amendment 10048 is Corrigendum No. 1

DD ENV 1090-3:2000  Execution of steel structures. Supplementary rules for high yield strength steels
Document History - Includes the National Application Document (NAD) This document is not to be regarded as a British Standard. ENV 1090-3:1997 has been thoroughly examined over a period of some years and is considered to be a suitable alternative execution standard to BS 5950-2, when used in conjunction with this NAD, in respect of high yield strength steels.

DD ENV 1090-6:2001  Execution of steel structures. Supplementary rules for stainless steel
Document History - This document is not to be regarded as a British Standard. ENV 1090-6:2000 has been thoroughly examined and is considered to be a suitable execution standard for stainless steels, when used in conjunction with this NAD. This assumes that DD ENV 1090-1 and its NAD are also applied.

DD ENV 1993-1.3:2001  Eurocode 3: Design of steel structures. General rules - Supplementary rules for cold formed thin gauge members and sheeting (together with
British Steel Sections, Plates and Commercial Steels

Design examples: BS 5950: Part 8: 1990 Code of practice for fire resistance design

Fire resistance of steel structures
The purpose of the present brochure is to describe modern methods of protecting structural steelwork and the design philosophies being developed to ensure its stability in fires.

Multi storey buildings
This paper looks at the concept of speed of construction and considers its effects on building costs.

Single storey buildings

Technical information: summary of main requirements and comparison with BS 4360

Butterworth-Heinemann Ltd

Structural steelwork connections
The aim of this book is to provide guidance on the art and science of connection design. The behaviour and design strengths of bolts, welds and other components in the connection are summarized. Methods of analysis are reviewed and a number of novel design aids to assist quick analysis are presented. Practicalities of connection construction are described to ensure that the designer can produce connections that are economic both to fabricate and erect.

Structural steelwork: design to limit state theory. 2nd edition | Part 1 - Introduction. (2 of 15)
Document History - This document is part of a larger document, Structural steelwork: design to limit state theory, which has been split into parts for ease of use.
This book describes the design theory and code requirements for common structural connections, elements and building frames through a structural learning course. Realistic examples of practical applications are used throughout, including full illustrations of sketching and detailing principles and a complete building frame design for a lattice roof building with crane.

Structural steelwork: design to limit state theory. 2nd edition | Part 2 - Materials. (3 of 15)
Document History - This document is part of a larger document, Structural steelwork: design to limit state theory, which has been split into parts for ease of use.
This book describes the design theory and code requirements for common structural connections, elements and building frames through a structural learning course. Realistic examples of practical applications are used throughout, including full illustrations of sketching and detailing principles and a complete building frame design for a lattice roof building with crane.
Chartered Institute of Building

Technical Information Sheet 51 Steelwork today

CIRIA

Report R 87 Lack of fit in steel structures
Various forms of lack of fit may be experienced in the fabrication and erection of a steel structure. From a comprehensive survey of fabricators, consultants and local authorities, it was possible to identify the principal causes of lack of fit, especially where these resulted in disagreement. Guidance is given on the significance of various forms of geometrical imperfection. In particular the behaviour of friction grip and bearing bolt, and welded connections has been studied, together with overall frame fit problems. Advice is given on how to avoid lack of fit difficulties on site, by taking appropriate measures at the design and fabrication stages.

European Convention for Construction Steelwork

Publication 22 Manual on the stability of steel structures
Presents a summary of the main features of the practical method of checking structures used at present, the purpose and explanation of the principal factors employed to ensure the safety of steel structures, a definition of the characteristic value for the strength of steel components and a method for determining this value which can be applied to components subject to instability.

Publication 28 Composite structures
Deals with the design and construction of composite structures. Recommendations apply to structures and members (beams, slabs or columns) consisting of a steel component and a reinforced or prestressed concrete component mechanically interconnected so as to act together to resist the load. Recommendations are given for
composite floors with profiled steel sheets and for beams with haunches, but not for encased composite beams.

**Publication 34** Lightweight steel based floor systems for multi-storey buildings

Presents new trends in the development and application of steel based floor systems. Mainly covers 'dry' steel floor systems. General functional requirements are given qualitatively. Includes specific quality demands for various types of application as 'quality profiles'. Discusses the suitability of different building materials and products on the market with respect to actual functional requirements and possible combinations of materials in integrated systems. Approaches safety assessment and contains examples of lightweight floors.

**Publication 48** Protection against corrosion inside buildings

Summarises theoretical physical and chemical influences on the formation of corrosion, as well as prevention. Reviews literature, damage cases and regulations to find out how the potential corrosion danger for the steel-work inside multi-storey buildings can be considered as dependent on local conditions. Primarily concerned with steel constructions with load-bearing functions exposed to different climatic conditions.

**Publication 50** Protection of steel structures against corrosion by coatings

Considers corrosion in different environments. Identifies the different types of protection against corrosion, elementary precautions to achieve effective protection, and techniques of surface preparation. Addresses painting of steel and zinc coated surfaces.

**Publication 59** European recommendations for sound insulation of steel construction in multi-storey buildings

Covers all types of multi-storey buildings where a certain sound insulation is required by local authorities or the operator, in particular residential and administrative buildings, hotels, schools and hospitals. Considers requirements, general principles to achieve high sound insulation and suitable design for steel buildings.

**Publication 61** Practical analysis of single-storey frames

Gives limits within which second-order effects can be neglected in plastic analysis of plane, single-storey, single-bay, pinned-base frames. Gives a method of plastic analysis for pinned-base frames of tapered cross-section.

**Institution of Structural Engineers**

*Appraisal of existing structures. 2nd edition.*

This report is particularly concerned with the structural appraisal of buildings, but it is also relevant in parts to the appraisal of other constructions such as bridges, masts, chimneys, cooling towers, cranes and gantries, docks and harbour works, underground structures, containment structures, liquid-excluding structures, pipelines and the like.

**Loss Prevention Certification Board**

*Loss Prevention Standard 1107 Requirements, tests and methods of assessment of passive fire protection systems for structural steelwork. Issue 1.1 dated 20/10/87*
Stipulates the performance criteria which apply to passive fire protection systems for structural steelwork. The structural steelwork is assumed to be loaded to the maximum permissible bending stresses specified in British Standard BS 449-2: 1969. The test procedures and heating regime of BS 476-8: 1972, Part 20, 21: 1987 are adopted where appropriate.

National House Building Council

*Standards Extra 34 NHBC Technical newsletter - December 2005*
Includes articles on: electrical safety in steel framed walls, structural insulated panel systems, acceptable methods of corbelling, and advice on construction detailing to ensure homes avoid water staining.

Steel Construction Institute

*Design manual for structural stainless steel, 3rd edition*
Complete revision of the 2nd edition, with an extended scope to include cold worked austenitic stainless steels and updated references to draft Eurocodes. Prepared for the guidance of engineers experienced in the design of carbon steel structural steelwork.

*Publication 057 Design of members subject to combined bending and torsion*
Document History - Reprinted - 1997
This report is concerned with the minority of cases, where the load on a member is eccentric to the shear centre. The publication is chiefly concerned with providing guidance for the design of hot rolled open sections, but, guidance on the design of hot rolled tubular sections is also given

*Publication 070 Steelwork design guide to BS 5950. Volume 4: Essential data for designers.*
Presents essential design data useful to steelwork designers and fabricators, much of it not readily available elsewhere. References to other publications, appropriate British Standards, and lists of manufacturers are provided, giving users quick access to a wide range of information.

*Publication 074 Parallel beam approach - a design guide*
Provides an innovative design system using a parallel beam grillage system in which continuity is developed in both secondary and primary beams. Includes advice on preliminary sizing, constructional aspects and fabrication and erection details. The parallel beam approach provides an economic solution for industrial and commercial structures, being particularly advantageous for buildings with high service contents.

*Publication 080 Fire resistant design of steel structures - a handbook to BS 5950: Part 8*
This publication describes the background to the new Code, BS 5950: Part 8 and its use in practice; cross-reference to the Code Clauses is provided in the margin for easy reference. Methods of evaluating fire resistance, based on tests or by calculation are outlined. Particular structural forms such as shelf angle and composite floors, portal frames and concrete filled hollow sections are included.
**Publication 082 Wind-moment design for unbraced frames**
This publication provides design rules for the wind-moment method which are consistent with BS 5950: Part 1: 1990. Where a steel frame is unbraced, an established technique is to rely on rotational stiffness of connections to provide resistance to wind. Such a restraint is ignored under gravity loads. The scope of the method is fully explained and a worked example is included.

**Publication 087 Fire and steel construction: behaviour of steel portal frames in boundary conditions. 2nd edition**
Outlines the background to the subject and describes the behaviour of portal frames in fire. Provides guidance on designing column bases to resist rafter collapse.

**Publication 101 Curtain wall connections to steel frames : interfaces**
Developed by an industry-wide steering committee including constructors, cladding designers, and engineers, this publication is intended to promote efficiency in the design and erection of cladding systems, and their attachments to steel frames. Section 1 details the advantages of carrying out preparatory operations including the lining and levelling of cladding connections prior to the erection operation.

**Publication 116 C-EC3 - Concise Eurocode 3 for the design of steel buildings in the United Kingdom**
A self-contained, stand-alone design code, introducing designers to the provisions of BS ENV 1993-1-1 Eurocode 3: Design of Steel Structures: Part 1.1 General Rules and Rules for Buildings, and concentrating on those portions of the code relevant to the design of steel structures for buildings. For usability the EC3 wording has been modified and new figures and tables inserted. Additionally, some clauses have been re-sequenced, some transferred from annexes into the main text, and some arranged by type of member (beams, columns, etc.) as in a UK code rather than by type of design criterion (yielding, buckling, etc.) as in EC3. In the main, however, the document follows the same sequence in which topics appear in EC3. Cross-references are given both to EC3 and to the UK National Application Document (NAD).

**Publication 117 Design procedures to C-EC3 - Concise Eurocode 3 for the design of steel buildings in the United Kingdom**
Contains the Procedure Tables featured in C-EC3 together with flowcharts which illustrate the use of the Tables and which are intended to assist practising engineers in developing computer programmes to perform the necessary calculations and checks.

**Publication 123 Concise guide to the structural design of stainless steel (2nd ed)**
This guide is based on BS 5950: Part 1 and provides guidance on the extension of the code for the design of stainless steel structures. This second edition extends its use to cover the standard carbon austenitic stainless steel grades 304 and 316.

**Publication 124 Fire resistance of web infilled steel columns**
A simple method of achieving 60 minutes fire resistance of steel columns by partial concrete encasement is presented. The columns should be designed as columns in simple construction according to BS 5950: Part 1. Four fire tests on columns were performed. The columns were subject to loads of 0.35 to 0.55 times the cold capacity of the steel section and achieved fire resistances of 58 to 72 minutes respectively. A
design method is proposed, together with design tables. Comparison between the tests and predicted performance is presented.

**Publication 130 Building design using cold formed steel sections: an architect's guide**
This publication is aimed at architects and gives information on the range of light steel frames and cold formed steel products that are used in buildings. A description of the steel framing methods and recent case examples is given, together with manufacturers' addresses and other sources of information. Technical issues are addressed with cross-references to other publications in this series.

**Publication 137 Comparative structural cost of modern commercial buildings. 2nd edition**
Presents the results of a study carried out in 2003-4. Provides information on new structural systems in steel, concrete and composite construction, and reviews the cost and construction programmes of all the construction systems, leading to updated costs and conclusions. Covers the influence of the choice of structural system on the non-frame elements such as foundations, cladding and services, which can have a major effect on overall costs. Two generic buildings are considered.

**Publication 138 Appraisal of existing iron and steel structures**
This publication gives guidance on the appraisal of existing iron and steel structures. It deals mainly with building structures in cast and wrought iron, and in steel up to 1968. A historical account of the manufacture of these materials and their use in building construction is provided, in order to highlight differences in design, forming, fabrication, and connection methods as compared with present-day practice. Guidance on appraisal strategy is accompanied by reviews of relevant material properties, defects, and methods of investigation of the existing structure. The assessment method offers a three-stage approach to calculations for checking structural adequacy, and also considers adequacy in fire. Load testing is discussed as a complementary method of checking structural adequacy. The three final sections consider methods of structure repair, strengthening and replacement, fire protection, and corrosion protection. Three Appendices list principal sources of available information, provide background details of the historical development of column analysis, and summarise current research on structural cast iron.

**Publication 145 Interim guidance on the use of Eurocode 3: Part 1.1 for European design of steel building structures**
This publication consists of two distinct but complementary parts. The first and major part is an introduction to the provisions of EC3. It discusses the purpose and principal content of each section of the Eurocode in a way that will be helpful to the new user. It is assumed that the reader has some previous knowledge of modern steelwork design and is familiar with the concept of limit states design using partial safety factors.

**Publication 147 Plastic design of single-storey pitched-roof portal frames to Eurocode 3**
This technical report will enable an engineer already familiar with portal frames to design structures that comply with Eurocode 3: Part 1.1. It is intended however to be a discussion document to help engineers understand the implications of EC3 on the
plastic design of portal frames, in order for the SCI to make informed comment to CEN for further development of the Eurocode.

**Publication 148 Modelling of steel structures for computer analysis**

Offers guidance for creating computer models for steel structures with orthodox details and connections. It highlights the importance of a qualitative understanding of structural response both during the creation and appraisal of the analysis output. Gives details of the elastic, plastic and elastic-plastic analysis of two and three dimensional frames, looks at the modelling of simple beams and column frames, trusses and lattice girders, portal frames, curved, tapered and non homogeneous members connections, supports and loads.

**Publication 152 Section property and member capacity tables for cold-formed stainless steel**

The aim of this publication is to provide design guidance and information to assist engineers in designing cold-formed stainless steel sections for use as structural members in both onshore and offshore construction. A comprehensive set of Design Tables is presented giving gross and effective section properties, section classification and member capacities for the wide range of cold-formed stainless steel sections. The structural forms covered by the Design Tables are rectangular and square hollow sections, channels, double channels back to back, equal angles, and double equal angles back to back. The grades of stainless steel covered are austenitic stainless steel grades 304, 316 and low carbon 316L, and also duplex 2205. This publication will greatly facilitate the design process for structural cold-formed stainless steel sections and thereby encourage more competitive design.

**Publication 158 Section properties and member resistances to Eurocode 3 (UB, UC and hollow sections)**

This design guide presents tables for column and beam design to DD ENV 1993-1-1: Eurocode 3: Design of steel structures: Part 1.1 General rules and rules for buildings. Design tables are presented for universal beams and universal columns and for structural hollow sections. Explanatory notes are presented, giving the background to the classification and the properties and resistances in the design tables. Worked examples for a beam and a column are included, illustrating the design of typical steel sections using the design tables including the modification of values.

**Publication 159 Structural fire design to EC3 and EC4, and comparison with BS 5950**

This guide provides background information, design tables and useful guidance on Part 1.2 'Structural Fire Design' of Eurocodes 3 and 4, dealing with structural design in steel and composite constructions respectively. The forms of construction that are covered by these Eurocodes include protected and unprotected steel beams and columns, composite beams and slabs, concrete encased and concrete-filled hollow sections, and special structures such as external steelwork. The publication reviews the scope and use of these Eurocodes, and extends the number of simplified tables on some of these forms of constructions that are considered to satisfy the requirements of the Eurocodes. Modifications to some tables in EC4: Part 1.2 are proposed. Worked examples on the fire resistance design of certain of these cases are presented in detail.
**Publication 162  Construction (Design and Management) Regulations 1994: Advice for designers in steel**

This guide is intended to provide information particularly relevant to constructional steelwork. It should be noted however, that the principles of CDM primarily affect the structural form and method of construction. Whilst the Regulations do impact on the choice of materials used in construction, it is unlikely that the choice of the primary structural material (e.g. reinforced concrete, timber, structural steelwork) will be based on an application of the Regulations. An explanation of the designer's duties under the Regulations is presented which is equally appropriate to materials other than structural steelwork. Comments are made on some of the hazards which may be considered as specific to structural steelwork.

**Publication 164 Design of steel portal frames for Europe**

Provides guidance on the design of steel portal frame buildings to both the specifier and the designer. It is targeted at the single storey construction market in continental Europe, and Eurocode 3 (ENV 1993-1-1) has been chosen for the basis of calculations to exploit the opportunity it provides for a commonly accepted design standard. Addresses the conceptual decisions that must be made to specify a portal frame building that will satisfy the clients requirements, and guides the designer through the principles of design of portal frames to Eurocode 3. Contains worked examples for both plastic portal and elastic portal design. Appendices present the detailed requirements of the Eurocode and list important differences between UK practice and the European requirements.

**Publication 167 Architectural teaching resource: Studio guide. 2nd edition**

Provides an architectural overview of structural steelwork solutions, including size ranges of steel products, descriptions of framing systems, common connection types, cladding systems and methods of fire protection.

**Publication 176 Case studies on light steel framing. Series 1 and 2**

Document History - Supplement to SCI P130 - Building design using cold formed steel sections: an architects guide, SCI P271 - Case studies on modular steel framing and SCI P171 - Oxford Brookes University demonstration building

Light steel framing combines the benefits of speed of construction with the ability to create exciting structural solutions. A range of recent applications of light steel framing is demonstrated in these case studies, which also give information on the form of construction, benefits and costs.

**Publication 178 Design for construction**

The general aim of this document is to raise awareness of the effects that basic design decisions can have on the overall buildability and cost of a building. Its scope is limited to the steel frame itself, and those components which interface directly with the frame. Furthermore, its focus is modern commercial and industrial buildings.

**Publication 179 Architects' guide to stainless steel**

Contains information on the design, specification, manufacture and maintenance of stainless steel architectural components in two sections: Design and Technology and Case Studies. Section one includes structural and performance information and reviews production and finishing processes. It focuses on those grades of stainless steel and techniques that are commonly used in relation to architectural components.
The second section provides an overview of the contemporary use of stainless steel in architecture. It comprises a broad and representative selection of building projects by leading architects and engineers.

**Publication 181 Environmental floor systems: A range of floor options for steel frame buildings which optimise thermal capacity**
This document describes the background to the development of naturally ventilated or cooled buildings and the associated key design features. Several possible systems for use with steel framed construction are outlined in principle. These systems are classified as 'passive', in which case the thermal capacity of the building fabric is simply exposed, or 'active', providing performance and control in maintaining ambient conditions. All of the passive systems use forms of construction in current use. The active systems rely on air ducted across the surface of the floor slab, and a number of generic solutions are presented appropriate to different flooring systems. Indicative measures of performance and cost are included, and related issues such as fire protection and lighting are addressed.

**Publication 183 Design of semi-continuous braced frames**
This document presents a method of analysis and design which permits semi-continuous braced steel frames to be designed by hand. A worked example of the approach is included in Appendix A. Appendix B gives a full procedure for estimating deflections more accurately, should this be required.

**Publication 186 Design of steel framed buildings without applied fire protection**
This publication presents the state-of-the-art methods that can be used to design steel framed structures without the need for passive fire protection materials for up to sixty minutes fire resistance. It covers the design of the following types of beam and column and includes design examples: non-composite downstand beams; composite downstand beams; slim floor beams; shelf angle beams; partially encased beams and unprotected columns; blocked-in columns; partially encased unreinforced and reinforced columns; concrete filled hollow section columns; brick or block encasement. Design data sheets for most of the design options are presented which facilitate design by providing tabulated information.

**Publication 193 Steel supported glazing systems: interfaces**
Modern glazing systems often rely on steel support structures which are visually expressed and important architectural elements. Tubular steel components and trusses combine structural efficiency with aesthetics. The glazing systems are frequently bolted to steel support structures. The bolts provide point support to the glazing panels instead of the continuous edge support provided by conventional frames. Applications of bolted glazing systems from simple shop windows to multi-storey glazed walls and large atria. Bolted fixings are commonly located toward the corners of glazing panels, and sometimes additionally at intermediate points on long edges. They connect glazing panels to glazing support attachments which in turn are connected to support structures.

**Publication 201 Handbook of structural steelwork. 3rd edition**
Document History - Joint publication with the British Construction Steel Association (BCSA).
Intended to present a practical guide to the design of structural steel elements for
buildings. Comprises three principal sections: general guidance, design data, and design tables.

Publication 202 Steelwork design guide to BS 5950-1:2000. Volume 1 section properties, member capacities. 6th edition (incorporating amendment 1) | Part 0 - Contents (1 of 6)
Document History - Produced in conjunction with the British Constructional Steelwork Association (BCSA). This document is part of a larger document, Steelwork design guide to BS 5950-1:2000. Volume 1, which has been split into parts for ease of use.
The Blue Book is an essential tool for steel designers, giving section properties and member capacities in tabular form for use in design to BS 5950-1:2000. The amendments to BS 5950-1 have resulted in significant technical changes to the rules to which steelwork is designed. This has resulted in numerous changes to member capacities and resistances. In addition to utilising the effective section properties in the member capacity calculations, the Blue Book includes a new set of tables that give the effective section properties for members subject to different loading conditions. Other additions include parallel flange channels, asymmetric beams and deep Universal Beams.

Document History - Produced in conjunction with the British Constructional Steelwork Association (BCSA). This document is part of a larger document, Steelwork design guide to BS 5950-1:2000. Volume 1, which has been split into parts for ease of use.
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Publication 202 Steelwork design guide to BS 5950-1:2000. Volume 1 section properties, member capacities. 6th edition (incorporating amendment 1) | Part B1 - Tables of dimensions and gross section properties: yellow pages (3 of 6)
Document History - Produced in conjunction with the British Constructional Steelwork Association (BCSA). This document is part of a larger document, Steelwork design guide to BS 5950-1:2000. Volume 1, which has been split into parts for ease of use.
The Blue Book is an essential tool for steel designers, giving section properties and member capacities in tabular form for use in design to BS 5950-1:2000. The amendments to BS 5950-1 have resulted in significant technical changes to the rules to which steelwork is designed. This has resulted in numerous changes to member capacities and resistances. In addition to utilising the effective section properties in the member capacity calculations, the Blue Book includes a new set of tables that give
the effective section properties for members subject to different loading conditions. Other additions include parallel flange channels, asymmetric beams and deep Universal Beams.


Document History - Produced in conjunction with the British Constructional Steelwork Association (BCSA). This document is part of a larger document, Steelwork design guide to BS 5950-1:2000. Volume 1, which has been split into parts for ease of use.

The Blue Book is an essential tool for steel designers, giving section properties and member capacities in tabular form for use in design to BS 5950-1:2000. The amendments to BS 5950-1 have resulted in significant technical changes to the rules to which steelwork is designed. This has resulted in numerous changes to member capacities and resistances. In addition to utilising the effective section properties in the member capacity calculations, the Blue Book includes a new set of tables that give the effective section properties for members subject to different loading conditions. Other additions include parallel flange channels, asymmetric beams and deep Universal Beams.

Publication 202 Steelwork design guide to BS 5950-1:2000. Volume 1 section properties, member capacities. 6th edition (incorporating amendment 1) | Part C (S275) - Member capacity tables: pink pages (5 of 6)

Document History - Produced in conjunction with the British Constructional Steelwork Association (BCSA). This document is part of a larger document, Steelwork design guide to BS 5950-1:2000. Volume 1, which has been split into parts for ease of use.

The Blue Book is an essential tool for steel designers, giving section properties and member capacities in tabular form for use in design to BS 5950-1:2000. The amendments to BS 5950-1 have resulted in significant technical changes to the rules to which steelwork is designed. This has resulted in numerous changes to member capacities and resistances. In addition to utilising the effective section properties in the member capacity calculations, the Blue Book includes a new set of tables that give the effective section properties for members subject to different loading conditions. Other additions include parallel flange channels, asymmetric beams and deep Universal Beams.

Publication 202 Steelwork design guide to BS 5950-1:2000. Volume 1 section properties, member capacities. 6th edition (incorporating amendment 1) | Part D (S355) - Member capacity tables: green pages (6 of 6)

Document History - Produced in conjunction with the British Constructional Steelwork Association (BCSA). This document is part of a larger document, Steelwork design guide to BS 5950-1:2000. Volume 1, which has been split into parts for ease of use.

The Blue Book is an essential tool for steel designers, giving section properties and member capacities in tabular form for use in design to BS 5950-1:2000. The amendments to BS 5950-1 have resulted in significant technical changes to the rules to which steelwork is designed. This has resulted in numerous changes to member capacities and resistances. In addition to utilising the effective section properties in
the member capacity calculations, the Blue Book includes a new set of tables that give
the effective section properties for members subject to different loading conditions.
Other additions include parallel flange channels, asymmetric beams and deep
Universal Beams.

Publication 207 Joints in steel construction: moment connections | Part 1 - Moment
connections. (1 of 2)
Document History - Published in association with the British Constructional Steel
Association (BCSA). This 3rd reprint published - 1997 (with amendments). First
published - 1995. This document is part of a larger document, Joints in steel
construction: moment connections, which has been split into parts for ease of use.
Provides method for designing the following types of moment resisting connections in
steel framed structures: Beam to column - Bolted end plates, Wind moment
connections and Shop and site welded connections, Beam - Bolted splices and
Welded splices, Columns - Bolted splices, Welded splices and Bases. This publication
does not cover connections subject to seismic loading.

Publication 207 Joints in steel construction: moment connections | Part 2 - Capacity
tables and dimensions for detailing. (2 of 2)
Document History - Published in association with the British Constructional Steel
Association (BCSA). This 3rd reprint published - 1997 (with amendments). First
published - 1995. This document is part of a larger document, Joints in steel
construction: moment connections, which has been split into parts for ease of use.
Provides method for designing the following types of moment resisting connections in
steel framed structures: Beam to column - Bolted end plates, Wind moment
connections and Shop and site welded connections, Beam - Bolted splices and
Welded splices, Columns - Bolted splices, Welded splices and Bases. This publication
does not cover connections subject to seismic loading.

Publication 212 Joints in steel construction: Simple connections (includes
corrigendum 1 October 2002) | Part 24 - Appendix H Capacity tables, dimensions for
detailing and general data - Dimensions for detailing (25 of 26)
Document History - Design guidance for a range of simple connections was originally
published in two separate volumes entitled Joints in simple construction: Volume 1:
Design Methods (P205) and Volume 2: Practical Applications (P206/92). This
document supersedes P205 and P206. Includes Corrigendum No1. dated October
2002. Jointly published with the BCSA. This document is part of a larger document,
Joints in steel construction: Simple connections and includes corrigendum 1 October
2002, which has been split into parts for ease of use.
Gives design guidance for structural steelwork connections for use in buildings
designed using the simple method, in accordance with BS 5950-1:2000. Following on
from previous work, it also covers a wider range of simple joints, design guidance for
bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-
Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in
double angle web cleats and fin plates, improved structural integrity guidance, use of
fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped
holes.

Publication 212 Joints in steel construction: Simple connections (includes
corrigendum 1 October 2002) | Part 25 - Appendix H Capacity tables, dimensions for
Gives design guidance for structural steelwork connections for use in buildings
designed using the simple method, in accordance with BS 5950-1:2000. Following on
from previous work, it also covers a wider range of simple joints, design guidance for
bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-
Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in
double angle web cleats and fin plates, improved structural integrity guidance, use of
fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped
holes.

Publication 212 Joints in steel construction: Simple connections (includes
corrigendum 1 October 2002) | Part 1 - Introduction (2 of 26)
Document History - Design guidance for a range of simple connections was originally
published in two separate volumes entitled Joints in simple construction: Volume 1:
Design Methods (P205) and Volume 2: Practical Applications (P206/92). This
document supersedes P205 and P206. Includes Corrigendum No1. dated October
2002. Jointly published with the BCSA. This document is part of a larger document,
Joints in steel construction: Simple connections and includes corrigendum 1 October
2002, which has been split into parts for ease of use.
Gives design guidance for structural steelwork connections for use in buildings
designed using the simple method, in accordance with BS 5950-1:2000. Following on
from previous work, it also covers a wider range of simple joints, design guidance for
bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-
Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in
double angle web cleats and fin plates, improved structural integrity guidance, use of
fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped
holes.
double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

**Publication 212** Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 2 - Standardised connections (3 of 26)

Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.

Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

**Publication 212** Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 3 - Beam-to-beam and beam-to-column connections (4 of 26)

Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.

Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

**Publication 212** Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 4 - Double angle web cleats (5 of 26)

Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.
Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 5 - Flexible end plates (6 of 26)
Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.
Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 6 - Fin plates (7 of 26)
Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.
Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 7 - Column splices (8 of 26)
Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This
document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.

Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 8 - Column bases (9 of 26)

Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.

Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 9 - Bracing connections (10 of 26)

Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.

Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.
double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 13 - Appendices A-G (14 of 26)
Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.
Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 14 - Appendix H Capacity tables, dimensions for detailing and general data - Contents (15 of 26)
Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.
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Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 15 - Appendix H Capacity tables, dimensions for detailing and general data - Standard fittings (16 of 26)
Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October
2002, which has been split into parts for ease of use. Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 16 - Appendix H Capacity tables, dimensions for detailing and general data - Double angle web cleats (17 of 26)

Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No.1 dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.

Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 17 - Appendix H Capacity tables, dimensions for detailing and general data - Flexible end plates (18 of 26)

Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No.1 dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.

Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 18 - Appendix H Capacity tables, dimensions for...
Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.
Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

**Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 21 - Appendix H Capacity tables, dimensions for detailing and general data - Column bases (22 of 26)**

Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.

Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

**Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 22 - Appendix H Capacity tables, dimensions for detailing and general data - Material strengths (23 of 26)**

Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.

Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

**Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 23 - Appendix H Capacity tables, dimensions for detailing and general data - Fastener capacities (24 of 26)**

Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October
Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

**Publication 213 Joints in steel construction: composite connections**
Document History - Produced in conjunction with the British Constructional Steelwork Association (BCSA).
Considers connections in frames where steel beams act compositely with concrete floor slabs, the structural interaction of the beams and slabs allows smaller beams to be used in a frame of given stiffness and strength. Shear connectors provide the means of enhancing moment capacity and stiffness by transferring longitudinal shear.

**Publication 249 Design capacity of kidney shaped slotted connections**
This report presents details of the testing of various two bolt connections, some with plain holes and some incorporating a single kidney shaped slot.

**Publication 252 Design of single-span steel portal frames to BS 5950-1:2000**
Gives an introduction to the design of single-span steel portal frames and brings together existing design guidance on this common form of construction.

**Publication 259 Fire resistance of concrete filled tubes to Eurocode 4**
This publication describes a design method for concrete filled hollow sections in fire. Section property tables are presented for square and circular hollow sections for 60 and 90 minutes fire resistance. Design examples are also given to illustrate their use.

**Publication 260 Building design using cold formed steel sections - value and benefit assessment of light steel framing in housing**
This publication provides guidance on the value and benefits of light steel frames in modern buildings, and is aimed at encouraging the wider use of this technology, based on a thorough understanding of the broad economic issues of construction, in service performance and financing costs.

**Publication 262 Building design using cold formed steel sections. Durability of light steel framing in residential building.**
This publication presents a summary and analysis of research findings on the durability of galvanized cold formed steel sections used in housing to deduce their design life.

**Publication 263 Wind-moment design of low rise frames**
This publication presents procedures for the design of wind moment frames in accordance with BS 5950-1. The publication gives design procedures for frames that are braced in the minor axis direction and for frames that do not have bracing in either
principal direction. The limitations of the method, which differ slightly for these two cases, are explained.

**Publication 272 Modular construction using light steel framing: an architects guide**
This publication addresses the design of modular construction, in which the units are pre-engineered in the factory and installed on site. The publication provides information suitable for use by architects and specifiers at the early stages in the design process.

**Publication 275 Steel intensive basements**
This publication gives guidance on the design and installation aspects of permanent steel sheet piled walls for steel intensive basement construction. This is particularly relevant to top-down construction methods where the sheet pile walls can be left in place and built into the final construction, being propped by cast in-situ concrete floor slabs, as the construction progresses deeper. A lower whole life cost is obtained due to simpler and faster construction, less risk of subsidence during construction, reduced maintenance costs through less leakage, and ease of removal at the end of service life.

**Publication 276 Building design using cold formed steel sections: structural design to BS 5950-5:1998 - section properties and load tables**
Document History - Supersedes Publication 089 Design of structures using cold formed steel sections, 1992
Gives an overview of the design principles for “cold formed” steel sections to BS 5950-5:1998. These sections are usually produced by cold rolling from galvanized steel strip and can be used in many ways, including housing, apartment buildings, mezzanine floors, roof trusses, frames for cladding, framework for modular units, separating and infill walls and canopies. Covers use of cold formed sections, design, building applications, section properties, load and performance characteristics.

**Publication 279 Better value in steel: Value and benefit assessment of Slimdek construction: Slimdek construction for shallow floors: Composite construction**
Slimdek is an engineered floor construction system that has been developed to meet demand for a cost-effective floor of minimal depth. This publication provides useful data on the value and benefit assessment of flooring solutions using Slimdek, based on evidence from case studies. Reasons for choosing Slimdek have been given as - achieving minimal floor depths, uninterrupted soffit with no down-stands, speed of construction (without temporary propping), fire protection needs are either eliminated or reduced and robust composite action can be achieved without shear studs.

**Publication 280 European demonstration project: Steel construction in housing**
This report gives details of a series of demonstration buildings that were constructed to promote the techniques of modern steel construction and represent a range of applications in scale, steel use and in different climates. There are 4 leaflets: 1. Efficient space planning for student residence at Oxford, UK. 2. Open plan space for detached house in Menden, Germany. 3. High quality apartments for social housing in Rheims, France. 4. Low energy housing for a cold climate, Finland.

**Publication 281 Design of curved steel**
Covers the design of common types of curved steel members used in building structures, and demonstrates how to take account of the curvature so that member
checks can be made in accordance with BS 5950-1:2000 or suitable modifications of that Standard. Includes six worked examples demonstrating the design of curved steel members used in different applications, curved in elevation, and curved on plan.

Publication 282 Light steel framing in renovation: Roof-top extensions, internal walls and over-cladding
Considers the benefits of using light steel framing in renovation work. Details applications and technical aspects of this approach.

Publication 283 Rapid dry envelope: Infill walls using light steel framing
Infill walls using light steel framing can be used in a wide range of building types to create a 'rapid dry envelope'. Provides information on recent applications, benefits, construction notes and technical specifications.

Publication 284 Modular construction in building extensions: New floors and new facilities using modular units
Discusses applications, value benefits and technical aspects of modular construction.

Publication 288 Fire safe design: a new approach to multi-storey steel framed buildings (No longer current but cited in Building Regulations)
Document History - This document is no longer current but is cited in Building Regulations. Replaced by 2nd edition
Large-scale fire tests and observations of actual fires have shown that real buildings perform better in fires than would be predicted from standard fire tests. Presents initial recommendations based largely on results from the BRE Cardington large-scale building fire test programme. Recommendations are limited to non-sway steel-framed buildings with composite floors in the low fire risk categories of up to 60 minutes. The guidance gives designers access to whole building behaviour and allows them to determine which members can remain unprotected while maintaining safety levels equivalent to traditional methods.

Publication 288 Fire safe design: a new approach to multi-storey steel-framed buildings. 2nd edition
Includes improvements to recommended design methods to allow economies to be made. Covers the basis of design, recommendations for structural elements, compartmentation, load ratios and limiting temperatures, design tables and using TSLAB, Cardington fire tests, evidence from other fires and other countries and some observations.

Publication 291 Structural design of stainless steel
Document History - This document is part of a larger document, Structural design of stainless steel: stainless steel, which has been split into parts for ease of use. A design guide for stainless steel aimed at engineers with experience in the design of carbon steel structural steelwork but not necessarily in the design of stainless steel structures. It is produced in order to promote safe and efficient use of stainless steel in structures.

Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 0 - Title page, contents, foreword, summary (1 of 17)
Document History - This document is part of a larger document, In-plane stability of
portal frames to BS 5950-1:2000, which has been split into parts for ease of use. This document details the essential calculation methods used for in-plane stability in single-storey portal frames. These are designed using plastic or elastic analysis and are part of the ultimate limit state verifications. Covering stability checks, sway-check method, amplified moments method, second-order analysis, member checks and worked examples.

Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 1 - In-plane stability checks in BS 5950-1:2000 (2 of 17)
Document History - This document is part of a larger document, In-plane stability of portal frames to BS 5950-1:2000, which has been split into parts for ease of use. This document details the essential calculation methods used for in-plane stability in single-storey portal frames. These are designed using plastic or elastic analysis and are part of the ultimate limit state verifications. Covering stability checks, sway-check method, amplified moments method, second-order analysis, member checks and worked examples.

Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 2 - Introduction to in-plane stability (3 of 17)
Document History - This document is part of a larger document, In-plane stability of portal frames to BS 5950-1:2000, which has been split into parts for ease of use. This document details the essential calculation methods used for in-plane stability in single-storey portal frames. These are designed using plastic or elastic analysis and are part of the ultimate limit state verifications. Covering stability checks, sway-check method, amplified moments method, second-order analysis, member checks and worked examples.

Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 3 - Sway-check method (4 of 17)
Document History - This document is part of a larger document, In-plane stability of portal frames to BS 5950-1:2000, which has been split into parts for ease of use. This document details the essential calculation methods used for in-plane stability in single-storey portal frames. These are designed using plastic or elastic analysis and are part of the ultimate limit state verifications. Covering stability checks, sway-check method, amplified moments method, second-order analysis, member checks and worked examples.

Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 4 - Amplified moments method (5 of 17)
Document History - This document is part of a larger document, In-plane stability of portal frames to BS 5950-1:2000, which has been split into parts for ease of use. This document details the essential calculation methods used for in-plane stability in single-storey portal frames. These are designed using plastic or elastic analysis and are part of the ultimate limit state verifications. Covering stability checks, sway-check method, amplified moments method, second-order analysis, member checks and worked examples.

Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 5 - Second-order analysis (6 of 17)
Document History - This document is part of a larger document, In-plane stability of
portal frames to BS 5950-1:2000, which has been split into parts for ease of use.
This document details the essential calculation methods used for in-plane stability in
single-storey portal frames. These are designed using plastic or elastic analysis and
are part of the ultimate limit state verifications. Covering stability checks, sway-check
method, amplified moments method, second-order analysis, member checks and
worked examples.

Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 6 -
Member checks (7 of 17)
Document History - This document is part of a larger document, In-plane stability of
portal frames to BS 5950-1:2000, which has been split into parts for ease of use.
This document details the essential calculation methods used for in-plane stability in
single-storey portal frames. These are designed using plastic or elastic analysis and
are part of the ultimate limit state verifications. Covering stability checks, sway-check
method, amplified moments method, second-order analysis, member checks and
worked examples.

Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 7 -
References (8 of 17)
Document History - This document is part of a larger document, In-plane stability of
portal frames to BS 5950-1:2000, which has been split into parts for ease of use.
This document details the essential calculation methods used for in-plane stability in
single-storey portal frames. These are designed using plastic or elastic analysis and
are part of the ultimate limit state verifications. Covering stability checks, sway-check
method, amplified moments method, second-order analysis, member checks and
worked examples.

Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 8 -
Appendix A - Second-order analysis of common portals 'by hand' (9 of 17)
Document History - This document is part of a larger document, In-plane stability of
portal frames to BS 5950-1:2000, which has been split into parts for ease of use.
This document details the essential calculation methods used for in-plane stability in
single-storey portal frames. These are designed using plastic or elastic analysis and
are part of the ultimate limit state verifications. Covering stability checks, sway-check
method, amplified moments method, second-order analysis, member checks and
worked examples.

Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 9 -
Appendix B - Second order analysis of tied portals 'by hand' (10 of 17)
Document History - This document is part of a larger document, In-plane stability of
portal frames to BS 5950-1:2000, which has been split into parts for ease of use.
This document details the essential calculation methods used for in-plane stability in
single-storey portal frames. These are designed using plastic or elastic analysis and
are part of the ultimate limit state verifications. Covering stability checks, sway-check
method, amplified moments method, second-order analysis, member checks and
worked examples.

Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 10 -
Appendix C - Effective stiffness of members (11 of 17)
Document History - This document is part of a larger document, In-plane stability of
portal frames to BS 5950-1:2000, which has been split into parts for ease of use. This document details the essential calculation methods used for in-plane stability in single-storey portal frames. These are designed using plastic or elastic analysis and are part of the ultimate limit state verifications. Covering stability checks, sway-check method, amplified moments method, second-order analysis, member checks and worked examples.

_Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 11 - Appendix D - Deflections from horizontal loads for 'hand' second-order calculations (12 of 17)_

Document History - This document is part of a larger document, In-plane stability of portal frames to BS 5950-1:2000, which has been split into parts for ease of use. This document details the essential calculation methods used for in-plane stability in single-storey portal frames. These are designed using plastic or elastic analysis and are part of the ultimate limit state verifications. Covering stability checks, sway-check method, amplified moments method, second-order analysis, member checks and worked examples.

_Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 12 - Appendix E - Hinge deflections by interpolation (13 of 17)_

Document History - This document is part of a larger document, In-plane stability of portal frames to BS 5950-1:2000, which has been split into parts for ease of use. This document details the essential calculation methods used for in-plane stability in single-storey portal frames. These are designed using plastic or elastic analysis and are part of the ultimate limit state verifications. Covering stability checks, sway-check method, amplified moments method, second-order analysis, member checks and worked examples.

_Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 13 - Worked Example 1 - Single span roof portal frame (14 of 17)_

Document History - This document is part of a larger document, In-plane stability of portal frames to BS 5950-1:2000, which has been split into parts for ease of use. This document details the essential calculation methods used for in-plane stability in single-storey portal frames. These are designed using plastic or elastic analysis and are part of the ultimate limit state verifications. Covering stability checks, sway-check method, amplified moments method, second-order analysis, member checks and worked examples.

_Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 14 - Worked Example 2 - Tied portal frame (15 of 17)_

Document History - This document is part of a larger document, In-plane stability of portal frames to BS 5950-1:2000, which has been split into parts for ease of use. This document details the essential calculation methods used for in-plane stability in single-storey portal frames. These are designed using plastic or elastic analysis and are part of the ultimate limit state verifications. Covering stability checks, sway-check method, amplified moments method, second-order analysis, member checks and worked examples.

_Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 15 - Worked Example 3 - Two-span portal frame (16 of 17)
Document History - This document is part of a larger document, In-plane stability of portal frames to BS 5950-1:2000, which has been split into parts for ease of use. This document details the essential calculation methods used for in-plane stability in single-storey portal frames. These are designed using plastic or elastic analysis and are part of the ultimate limit state verifications. Covering stability checks, sway-check method, amplified moments method, second-order analysis, member checks and worked examples.

Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 16 - Worked Example 4 - Two-span portal frame with hit/miss internal columns (17 of 17)

Publication 297 Stainless steel masonry support systems - best practice information sheet for contractors
Document History - Published in conjunction with the Masonry Support Information Group (MSIG)
Aimed at site engineers, foremen and operatives, this publication provides information on the correct storage, handling and installation of stainless steel masonry support systems.

Publication 298 Stainless steel masonry support systems - best practice information sheet for specifiers
Document History - Published in conjunction with the Masonry Support Information Group (MSIG)
This publication provides information on the types of support systems available and standard methods of fixing to the structural frame. It is aimed at making specifiers aware of the requirements of the structural frame to ensure that stainless steel masonry support systems are simple and efficient.

Publication 301 Building design using cold formed steel sections. Light steel framing in residential construction
This publication provides information and guidance on the construction of light steel frames in general applications for residential construction, which includes single family houses and apartments. Light steel framing systems use galvanized cold formed steel sections as the primary structural components, which can be assembled as prefabricated panels. The publication addresses aspects of design within the scope of the Building Regulations (England and Wales). It also covers construction practice and detailing of light steel frames and their interfaces with other materials and components. Detailed design information is given on structural design and robustness, serviceability of floors, thermal and acoustic performance, and fire resistant design. A list of manufacturers is presented.

This publication provides information and guidance on the design of modular construction in residential and similar buildings. It covers the requirements of the Building Regulations (England and Wales) and presents design methods and details which satisfy these requirements. The particular requirements that are covered are: structure and loading, fire safety, acoustic performance, and thermal performance.

**Publication 304 Guide to the major amendments in BS 5950-1:2000**
BS 5950-1:2000 Structural use of steelwork in building. Code of practice for design - Rolled and welded sections, has undergone major amendment. Almost every Clause of the Standard has changed, some of the changes are technical in nature, others are editorial and do not alter recommendations for building design. Guides designers through the major technical amendments. A short description of each important change is provided, and simple worked examples illustrate revised design procedures. The revised Standard, BS 5950-1:2000, became effective on 15 August 2001.

**Publication 307 Energy efficiency housing using light steel framing: how to meet the proposed new requirements of Part L of the Building Regulations**
Details are given for the changes to Part L, construction details, demonstration building and given an overview of light steel framing (LSF).

**Publication 309 Case studies on Slimdek**
Slimdek is an engineered floor construction system that has been developed to meet demand for a cost-effective floor of minimal depth. This publication contains details of 6 case studies on the use of Slimdek within various construction projects including: 1. Slimdek for high quality residential building at Cardiff Bay. 2. Bold design of ING Bank H.Q. realised using Slimdek. 3. Slimdek used in award-winning building development in Dublin. 4. Glasgow miles better for Slimdek - including data sheet - acoustic performance of Slimdek in residential buildings. 5. Renovation of prestige retail stores, Guildford, Surrey. 6. University chooses Slimdek for 15-storey student residence.

**Publication 313 Single storey steel framed buildings in fire boundary conditions**
Provides, in addition to UK building regulations, design recommendations and guidance for single storey buildings for design in fire situations. It shows that fire protection to the roof structure, which would be expensive to provide, is not necessary, provided that recommendations on column base design are followed. The advice and recommendations cover single and multi-bay portal frames, monopitch portal frames, gable frames and frames with trussed roofs. Background to the recommendations is given and mathematical models are explained.

**Publication 315 Hospital and health buildings using steel: Meeting the needs of the health sector for modern, rapid-build, adaptable hospitals**
Addresses steel construction systems particularly relevant to the health sector. Provides examples of different approaches in steel construction for a number of hospitals. Considers the benefits of steel construction and covers design issues in the light of standards.

**Publication 320 Acoustic performance of light steel framed systems: Meeting the new requirements of Part E of the Building regulations (2003)**
Sets out how the requirements of Part E can be satisfied in light steel framing and
gives a variety of solutions for separating walls and floors that have shown good performance when tested on site

**Publication 321** Acoustic performance of Slimdek: meeting the new requirements of the Building regulations (2003)
Sets out how the requirements of Part E can be satisfied using Slimdek construction.

**Publication 324** Tension control bolts, grade S10T, in friction grip connections
Provides an industry standard for the design of structural steelwork connections using preloaded Tension Control Bolts Grade, S10T (TCBs). A design method that satisfies the recommendations of BS 5950-1:2000 and BS 5400-3:2000 is given. A description of the tightening process, an outline of the manufacturing specifications, procurement requirements and design tables are also included. Worked examples are provided, illustrating the design of typical steelwork connections using preloaded TCBs.

**Publication 325** Introduction to steelwork design to BS 5950-1:2000 (2006 reprint with minor corrections)
This publication provides an initial commentary on BS 5950-1:2000 for design in simple and continuous construction using hot rolled sections. Introduces the limit state concept. Details the properties of steel, local buckling and section classification, tension and compression members, restrained and unrestrained beams, design of beam webs, axial loads and bending, columns in simple structures, connections, plastic design of portal frames, plate girders, continuous multi-storey frames and crane gantry girders

**Publication 326** Steelwork design guide to BS 5950-1:2000. Volume 2. Worked examples | Part 0 - Title page, foreword, contents and introduction. (1 of 25)
Document History - Supersedes SCI Publication 002 (1991). This is a companion to the Blue Book, Steelwork design guide to BS 5950-1:2000. Volume 1, which provides section property and member capacity tables. This document is part of a larger document, Steelwork design guide to BS 5950-1:2000. Volume 2. Worked examples, which has been split into parts for ease of use.
Provides examples to meet the requirements of the BS by showing the design process. Covers all checks required by the code and illustrates those considered critical in design.

**Publication 326** Steelwork design guide to BS 5950-1:2000. Volume 2. Worked examples | Part 1 - Example 1 Choosing a steel sub-grade. (2 of 25)
Document History - Supersedes SCI Publication 002 (1991). This is a companion to the Blue Book, Steelwork design guide to BS 5950-1:2000. Volume 1, which provides section property and member capacity tables. This document is part of a larger document, Steelwork design guide to BS 5950-1:2000. Volume 2. Worked examples, which has been split into parts for ease of use.
Provides examples to meet the requirements of the BS by showing the design process. Covers all checks required by the code and illustrates those considered critical in design.

Document History - Supersedes SCI Publication 002 (1991). This is a companion to the Blue Book, Steelwork design guide to BS 5950-1:2000. Volume 1, which provides section property and member capacity tables. This document is part of a larger document, Steelwork design guide to BS 5950-1:2000. Volume 2. Worked examples, which has been split into parts for ease of use.

Provides examples to meet the requirements of the BS by showing the design process. Covers all checks required by the code and illustrates those considered critical in design.


Document History - Supersedes SCI Publication 002 (1991). This is a companion to the Blue Book, Steelwork design guide to BS 5950-1:2000. Volume 1, which provides section property and member capacity tables. This document is part of a larger document, Steelwork design guide to BS 5950-1:2000. Volume 2. Worked examples, which has been split into parts for ease of use.

Provides examples to meet the requirements of the BS by showing the design process. Covers all checks required by the code and illustrates those considered critical in design.

Publication 326 Steelwork design guide to BS 5950-1:2000. Volume 2. Worked examples | Part 4 - Example 4 Simply supported beam with lateral restraint at load application points. (5 of 25)

Document History - Supersedes SCI Publication 002 (1991). This is a companion to the Blue Book, Steelwork design guide to BS 5950-1:2000. Volume 1, which provides section property and member capacity tables. This document is part of a larger document, Steelwork design guide to BS 5950-1:2000. Volume 2. Worked examples, which has been split into parts for ease of use.

Provides examples to meet the requirements of the BS by showing the design process. Covers all checks required by the code and illustrates those considered critical in design.

Publication 326 Steelwork design guide to BS 5950-1:2000. Volume 2. Worked examples | Part 5 - Example 5 Simply supported beam with lateral restraint at load application points using a class 3 UC. (6 of 25)

Document History - Supersedes SCI Publication 002 (1991). This is a companion to the Blue Book, Steelwork design guide to BS 5950-1:2000. Volume 1, which provides section property and member capacity tables. This document is part of a larger document, Steelwork design guide to BS 5950-1:2000. Volume 2. Worked examples, which has been split into parts for ease of use.

Provides examples to meet the requirements of the BS by showing the design process. Covers all checks required by the code and illustrates those considered critical in design.

Publication 326 Steelwork design guide to BS 5950-1:2000. Volume 2. Worked examples | Part 6 - Example 6 Beam under combined bending and torsion using a UC section. (7 of 25)

Document History - Supersedes SCI Publication 002 (1991). This is a companion to
the Blue Book, Steelwork design guide to BS 5950-1:2000. Volume 1, which
provides section property and member capacity tables. This document is part of a
examples, which has been split into parts for ease of use.
Provides examples to meet the requirements of the BS by showing the design process.
Covers all checks required by the code and illustrates those considered critical in
design.

Publication 326 Steelwork design guide to BS 5950-1:2000. Volume 2. Worked
examples | Part 7 - Example 7 RHS beam under combined bending and torsion. (8 of
25)
Document History - Supersedes SCI Publication 002 (1991). This is a companion to
the Blue Book, Steelwork design guide to BS 5950-1:2000. Volume 1, which
provides section property and member capacity tables. This document is part of a
examples, which has been split into parts for ease of use.
Provides examples to meet the requirements of the BS by showing the design process.
Covers all checks required by the code and illustrates those considered critical in
design.

Publication 326 Steelwork design guide to BS 5950-1:2000. Volume 2. Worked
examples | Part 8 - Example 8 Continuous beam designed elastically. (9 of 25)
Document History - Supersedes SCI Publication 002 (1991). This is a companion to
the Blue Book, Steelwork design guide to BS 5950-1:2000. Volume 1, which
provides section property and member capacity tables. This document is part of a
examples, which has been split into parts for ease of use.
Provides examples to meet the requirements of the BS by showing the design process.
Covers all checks required by the code and illustrates those considered critical in
design.

Publication 326 Steelwork design guide to BS 5950-1:2000. Volume 2. Worked
examples | Part 9 - Example 9 Continuous beam designed plastically. (10 of 25)
Document History - Supersedes SCI Publication 002 (1991). This is a companion to
the Blue Book, Steelwork design guide to BS 5950-1:2000. Volume 1, which
provides section property and member capacity tables. This document is part of a
examples, which has been split into parts for ease of use.
Provides examples to meet the requirements of the BS by showing the design process.
Covers all checks required by the code and illustrates those considered critical in
design.

Publication 326 Steelwork design guide to BS 5950-1:2000. Volume 2. Worked
examples | Part 10 - Example 10 Pinned column using a non-slender UC. (11 of 25)
Document History - Supersedes SCI Publication 002 (1991). This is a companion to
the Blue Book, Steelwork design guide to BS 5950-1:2000. Volume 1, which
provides section property and member capacity tables. This document is part of a
examples, which has been split into parts for ease of use.
Provides examples to meet the requirements of the BS by showing the design process.
Covers all checks required by the code and illustrates those considered critical in
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**Publication 328** Case studies on residential buildings using steel


This document provides information on using steel for residential buildings with details obtained from 12 case studies of recent projects, covering issues of efficiency, adaptability and high quality. This document aims to meet the constraints of construction in inner city locations as well as the demands of the multi-storey residential sector. It encompasses a wide range of steel technologies, including a 'mix' of technologies to achieve optimised design and better value in steel. The steel technologies covered by the case studies are: Light Steel Framing Modular Construction Slimdek and Slimflor Composite Construction.

**Publication 329** Multi-storey residential buildings using steel: Steel technologies to meet new housing demands

Presents the principal steel construction systems used in the multi-storey residential sector. Provides examples of these different technologies, discusses value benefits and considers issues that are relevant to the choice of construction technology.

**Publication 332** Steel in multi-storey residential buildings

Presents the main features and benefits of a range of steel-intensive construction technologies applicable to the residential building sector: composite construction, 'Slimdek', 'Slimflor', light steel framing, modular construction and light steel separating walls. Supported by examples. Describes aspects influencing design of buildings, like regulatory requirements, aspects of compliance with these regulations, and how to achieve robustness in structure. Cladding options, balconies, parapet walls and water-tight basements are also detailed.
Publication 334 Design of multi storey braced frames
Covers the design of braced, steel-framed multi-storey buildings, and offers guidance on the structural design of the superstructure. Detailed guidance is given on the application of the frame stability checks specified in BS 5950-1:2000, and how the Standard directs that any significant second-order effects may be allowed for. Details are given for the common floor systems used in most multi-storey structures, providing typical framing layouts, typical member sizes and construction depths.

Publication 336 Acoustic detailing for multi storey residential buildings
Provides guidance on acoustic details for steel framed residential buildings. Details are given for the junction of external walls with separating floors and separating walls with separating floors. The floor constructions included are in-situ concrete slabs with shallow profiled metal deck supported on hot-rolled steel sections, in-situ concrete slabs with deep profiled metal deck supported on ASB (Asymmetric Beams) or RHS edge beams and precast concrete units supported on hot-rolled steel sections. The wall constructions included are light steel framing and masonry blockwork.

Publication 338 Quicon® - Design guide to BS 5950-1
Introduces the system, looks at the design model, gives standard details including components, connections and fabrication and provides design tables.

Publication 341 Guidance on meeting the robustness requirements in Approved Document A (2004 edition)
Provides designers with the necessary guidance to enable them to ensure compliance with the disproportionate collapse requirements of the revised regulations. Includes worked examples.

Publication 343 Insulated render systems used with light steel framing
Good practice recommendations and advice are given on choosing details appropriate to the degree of exposure to wind driven rain. A performance scoring system is presented; the minimum requirements are based on the BRE exposure classifications. Details are given which provide 'back-up' or robust long term performance in the event of any water ingress or condensation behind the render layer.

Whittles Publishing

Off site fabrication: prefabrication, preassembly and modularisation | Part 0 - Contents and introduction. (1 of 9)
Document History - This document is part of a larger document, Off site fabrication, which has been split into parts for ease of use.
Provides a complete guide to off site fabrication, covering the principles, applications and implications for design and construction. Many case studies and examples from around the world are used to illustrate the flexibility of the system. Covers: Context - scope, codification and history, Principles - understanding key issues, time, cost, quality, reliability, reusability and health and safety Applications - residential, light industrial, commercial, retail, civil engineering applications, offshore applications and building services applications, Case Studies, Implications - procurement strategy, design implications, design innovations, trial assemblies, transportation and installation, and Action - project wide strategies, project characteristics and applications of the strategy to optimise benefits.
and implications for design and construction. Many case studies and examples from around the world are used to illustrate the flexibility of the system. Covers: Context - scope, codification and history, Principles - understanding key issues, time, cost, quality, reliability, reusability and health and safety Applications - residential, light industrial, commercial, retail, civil engineering applications, offshore applications and building services applications, Case Studies, Implications - procurement strategy, design implications, design innovations, trial assemblies, transportation and installation, and Action - project wide strategies, project characteristics and applications of the strategy to optimise benefits.

**Off site fabrication: prefabrication, preassembly and modularisation | Part 2 - Principles. (3 of 9)**

Document History - This document is part of a larger document, Off site fabrication, which has been split into parts for ease of use.

Provides a complete guide to off site fabrication, covering the principles, applications and implications for design and construction. Many case studies and examples from around the world are used to illustrate the flexibility of the system. Covers: Context - scope, codification and history, Principles - understanding key issues, time, cost, quality, reliability, reusability and health and safety Applications - residential, light industrial, commercial, retail, civil engineering applications, offshore applications and building services applications, Case Studies, Implications - procurement strategy, design implications, design innovations, trial assemblies, transportation and installation, and Action - project wide strategies, project characteristics and applications of the strategy to optimise benefits.

**Off site fabrication: prefabrication, preassembly and modularisation | Part 3 - Applications. (4 of 9)**

Document History - This document is part of a larger document, Off site fabrication, which has been split into parts for ease of use.

Provides a complete guide to off site fabrication, covering the principles, applications and implications for design and construction. Many case studies and examples from around the world are used to illustrate the flexibility of the system. Covers: Context - scope, codification and history, Principles - understanding key issues, time, cost, quality, reliability, reusability and health and safety Applications - residential, light industrial, commercial, retail, civil engineering applications, offshore applications and building services applications, Case Studies, Implications - procurement strategy, design implications, design innovations, trial assemblies, transportation and installation, and Action - project wide strategies, project characteristics and applications of the strategy to optimise benefits.

**Off site fabrication: prefabrication, preassembly and modularisation | Part 5 - Implications. (6 of 9)**

Document History - This document is part of a larger document, Off site fabrication, which has been split into parts for ease of use.

Provides a complete guide to off site fabrication, covering the principles, applications and implications for design and construction. Many case studies and examples from around the world are used to illustrate the flexibility of the system. Covers: Context - scope, codification and history, Principles - understanding key issues, time, cost, quality, reliability, reusability and health and safety Applications - residential, light industrial, commercial, retail, civil engineering applications, offshore applications and
building services applications, Case Studies, Implications - procurement strategy, design implications, design innovations, trial assemblies, transportation and installation, and Action - project wide strategies, project characteristics and applications of the strategy to optimise benefits.

Off site fabrication: prefabrication, preassembly and modularisation | Part 8 - Index. (9 of 9)

Document History - This document is part of a larger document, Off site fabrication, which has been split into parts for ease of use.
Provides a complete guide to off site fabrication, covering the principles, applications and implications for design and construction. Many case studies and examples from around the world are used to illustrate the flexibility of the system. Covers: Context - scope, codification and history, Principles - understanding key issues, time, cost, quality, reliability, reusability and health and safety Applications - residential, light industrial, commercial, retail, civil engineering applications, offshore applications and building services applications, Case Studies, Implications - procurement strategy, design implications, design innovations, trial assemblies, transportation and installation, and Action - project wide strategies, project characteristics and applications of the strategy to optimise benefits.

Welding Institute

Guidelines for fracture-safe and fatigue-reliable design of steel structures
This book presents the authors work and concepts on applications of fracture mechanics and structural integrity technology.

Steel protection

Architects' Journal

Zinc against rust. AJ 16.2.83

Association for Specialist Fire Protection

Document History - No longer current but cited in the Building Regulations. Superseded by the 2nd revision of the 2nd edition 2000
Presents economical methods for the fire protection of structural steel to provide compliance with Building Regulations with a comprehensive guide to proprietary materials and systems, all of which are manufactured, marketed or site applied by members of ASFPCM. Also contains specifications of generically described materials, the use of which is traditional. The details are presented in a methodical arrangement from which a specifier can readily obtain the data required to provide a given period of fire protection to steel members of various sizes and weights

Fire protection for structural steel in buildings, 3rd edition (Revised June 2004)
Document History - Produced in conjunction with the Steel Construction Institute (SCI) and the Fire Test Study Group (FSTG - UK). The Yellow book.
Presents economical methods for the fire protection of structural steelwork to provide compliance with building regulations. Provides a comprehensive guide to proprietary materials and systems, all of which are manufactured, marketed or site applied by members of ASFP. Also contains information for some products showing the variation of protection thickness with steel failure temperature. Covers: Basic concepts of fire testing and how to specify fire protection, Guidance on calculation of the section factor in non standard cases, Fire resistance test and assessment procedures using UK methods, New European assessment procedures and Material data sheets and their use.

*Supplement to 2nd edition (revised) Fire protection for structural steel in buildings. (No longer current but cited in the Building Regulations)*

Document History - This supplement to the 1st revision of the 2nd edition is no longer current, it has been incorporated into the 2nd revised edition of the 2nd edition. The purpose of this supplement is to provide the specifier and end user with an update of new and improved materials introduced since the publication of the second edition.

*Over cladding of thin film intumescents on steel sections advisory notice*

Summarises possible effects of the over cladding of steel coated with thin film intumescent products.

*Technical Guidance Note 002* Spray coatings for the fire protection of structural steel. Part 1: Technical guidance note for the mechanical retention of sprayed mineral coatings based upon the requirements of BS 8202: Part 1: 1993

The recommendations made in this guidance note are based on BS 8202: Part 1: 1993 for the sprayed application of lightweight mineral coatings which may, or may not, require mechanical retention for the fire protection of structural steel elements of construction.

*Technical Guidance Note 003: P1* On site measurement of intumescent coatings - Part I Technical Guidance Note for the measurement of dry film thickness (dft’s) for intumescent coatings

This document gives practical guidance in the selection of instrumentation, its calibration and use in measuring the applied thicknesses of an intumescent coating system used to impart fire resistance to elements of structure and the correct interpretation of such data.

*Technical Guidance Note 006* Structural steel fire protection using intumescent coating systems in conjunction with: existing paint layers: zinc rich primers

This note provides advice on structural steel fire protection using intumescent coating systems in conjunction with: existing paint layers: zinc rich primers.

**British Board of Agreement**

*Zinc coated steels in buildings*

This review of the performance of zinc coated steels in buildings was commissioned by the British Board of Agreement to establish what information was available on the corrosion resistance of galvanised steel building components (unpainted) in the various environments present in the domestic house.
Information Paper 16/00 Low-solvent primers: performance in construction steelwork

This information paper provides guidance on the selection, application and performance of low solvent content pre- and post- fabrication primers applied as temporary protection to prevent corrosion of structural steelwork. This paper forms one of four addressing the issues of low-VOC coatings on a range of construction substrates.

British Standards Institution

BS 5493:1977 Code of practice for protective coating of iron and steel structures against corrosion (AMD 4443) (AMD 7898) (Declared obsolescent but remains current and is cited in Building Regulations)

Document History - Partially superseded by Parts 1 to 8 of BS EN ISO 12944 and BS EN ISO 14713:1999. This document is declared obsolescent but remains current and is cited in Building Regulations

Guidance on how to specify a chosen protective system, how to ensure its correct application and how to maintain it. Does not include specific recommendations for ships, vehicles, offshore platforms, specialized chemical equipment, cladding materials, plastics coatings, cement-mortar linings or weathering steels.


Document History - Renumbered to BS EN ISO 8503-2:1995


Document History - Renumbered to BS EN ISO 8503-5:2004

Describes a field method for measuring the surface profile produced by abrasive blast-cleaning procedures. These method use replica tape and a suitable gauge for measuring, on site, the roughness of a surface before the application of paint or another protective coating.

BS EN 10143:2006 Continuously hot-dip metal coated steel sheet and strip - tolerances on dimensions and shape


Applies to continuously zinc (Z), zinc-iron alloy (ZF), zinc-aluminium alloy (ZA), aluminium-zinc alloy (AZ) and aluminium-silicon alloy (AS) hot-dip coated flat products made of low carbon and high strength steels for cold forming and of structural steels with a minimum thickness of 0,20 mm and a maximum thickness of 6,50 mm, delivered as sheet, wide strip, slit wide strip or cut lengths obtained from slit wide strip or sheet.

BS EN 10326:2004 Continuously hot-dip coated strip and sheet of structural steels - Technical delivery conditions
BS EN ISO 12944-6:1998 Paints and varnishes - Corrosion protection of steel structures by protective paint systems. Laboratory performance test methods
Document History - All of the parts of this standard, collectively, partially supersede BS 5493:1977

BS EN ISO 12944-7:1998 Paints and varnishes - Corrosion protection of steel structures by protective paint systems. Execution and supervision of paintwork
Document History - All of the parts of this standard, collectively, partially supersede BS 5493:1977

BS EN ISO 12944-8:1998 Paints and varnishes - Corrosion protection of steel structures by protective paint systems. Development of specifications for new work and maintenance
Document History - All of the parts of this standard, collectively, partially supersede BS 5493:1977

BS EN ISO 14713:1999 Protection against corrosion of iron and steel in structures - zinc and aluminium coatings - guidelines
Document History - Supersedes BS 4479-6:1990 and partially supersedes BS 5493:1977

British Steel Sections, Plates and Commercial Steels

Corrosion protection
This publication covers corrosion; surface preparation and protective coatings.

Prevention of corrosion on structural steelwork
Cost effective corrosion protection of structural steelwork should present little difficulty for common applications and environments if the factors that affect durability are recognised at the outset. This publication aims to give specifiers an insight into the factors involved.

British Steel Tubes and Pipes

Design for SHS. Fire resistance to BS 5950: Part 8
This handbook has been prepared as a guide for qualified engineers experienced in the design of structural steel. It is based on BS 5950 part 8 and provides guidance on the use of the code for the fire resistant design of structural hollow sections.

Design Manual for Concrete Filled Columns Part 2 Fire resistant design
This guide has been prepared to enable designers to use structural hollow sections filled with concrete as structural components in buildings and bridges.

CIRIA

Report R 93 Painting steelwork
The principles of metallic corrosion are described and the different techniques of preparing substrates explained. Prior to painting, metallic coatings are often used, and the methods of application are outlined. Paint types and constituents are described, together with a discussion on selection of particular systems. The methods of paint
application and quality/inspection testing are assessed. Methods by which the economics of protecting steelwork against corrosion by painting can be assessed are given.

**Report R 174 New paint systems for the protection of construction steelwork**

This report gives guidance on the selection, application and specification of coatings for use in the general steel fabrication industry. The topics covered include a review of the relevant Environmental, Health and Safety legislation, the range of available materials, the relevance and use of these in general steel construction, the advantages and disadvantages of the new materials, including cost information. The report also includes standard material specifications for a range of environments commonly encountered in general construction.

**Engineering Equipment and Materials Users' Association**

**Publication 159 Volume 1 Users guide to the inspection, maintenance and repair of above ground vertical cylindrical steel storage tanks - Main text. (Volume 1). 3rd edition (Incorporating corrigenda and amendments no 1, February 2004)**

Document History - Incorporating corrigenda and amendments no 1, February 2004. Intended primarily to assist in the establishment of essential inspection requirements for aboveground, vertical, cylindrical, steel storage tanks, in order to minimise in-service problems and extend useful life. For such requirements to be properly interpreted and understood, comprehensive guidance is given on many key design features, on common problems experienced during operation and on repair methods. The recommendations contained herein are written particularly for the guidance of inspection and maintenance engineers. Some sections should also be of interest to operations personnel who need to be made aware of the parameters and conditions that may make equipment unsafe or accelerate rates of deterioration.

**Steel Construction Institute**

**Publication 129 Building design using cold formed steel sections: fire protection**

Provides information on the performance of cold formed steel sections at elevated temperatures, and presents methods for protecting cold formed steel sections used in floors and walls, and as individual structural members. The guidance covers the fire resistance of protected sections in floors and walls acting as compartment walls and the fire protection of conventional beams and columns.

**Publication 160 Structural fire design: off site applied thin film intumescent coatings - part 1: design guidance and part 2: model specification. 2nd edition**

Document History - Supersedes 1996 edition. Provides information on intumescent coatings, off-site application methods and their use, fire resistant design and background information relating to the specific requirements of off-site application of thin film intumescent coatings. The Model Specification provides clients and specifiers with the necessary information to facilitate the adoption and specification of these coatings and their off-site application, and will help to achieve greater uniformity in contract specifications that are issued with tender and contract documents.
Publication 241 Durability of steel bridges: a survey of the performance of protective coatings
The purpose of this report is to present views and findings about the durability of corrosion protection systems applied to primary structural members of bridge steelwork. It presents the results of an independent survey into the performance of protective coating systems for bridge steelwork.

Document History - Supersedes RT983.
Provides conservative generic guidance applicable to any intumescent coating. Guidance applies to both composite and non-composite beams.

Transport Research Laboratory

Project Report PR/SE/726/03 Passive safety tests on steel circular hollow section sign posts
Document History - Project Number: 3/359 (TRL 11106660)
Traditionally roadside signs are supported on tubular steel circular hollow section (CHS) posts. A variety of sizes and configurations are used, dependent on the size of the sign to be supported. The HA have recently updated their documentation and introduced two new documents Interim Requirements for Road Restraint Systems (IRRRS) and Non-Proprietary Safety Barrier Systems (NPSBS). To support the new documentation it was decided to conduct a series of impact tests to establish the largest size of unprotected single steel tubular sign support posts that can be allowed on the HA Road Network.

Steel pipes

British Standards Institution

BS 10:1962 Specification for flanges and bolting for pipes, valves and fittings (PD 5413) (PD 5823) (PD 5949) (AMD 585)
For use with pipes, valves and fittings containing steam, oil, compressed air or water within the following temperature ranges and pressure, -328°F (-200°C) up to and including 975°F (524°C) and up to and including 2800 lb/in

BS 416-1:1990 Discharge and ventilating pipes and fittings, sand-cast or spun in cast iron. Specification for spigot and socket systems
Document History - Supersedes BS 416:1973
Requirements for cast grey or ductile iron spigot and socket pipes manufactured by either the sand-cast or the spun process, with either Type A or Type B sockets.

BS 864-2:1983 Capillary and compression tube fittings of copper and copper alloy. Specification for capillary and compression fittings for copper tubes (AMD 5097) (AMD 5651) (AMD 7067) (Declared obsolescent and is superseded but remains...
Specifies requirements for capillary fittings and compression fittings for use with copper tubes of specified dimensions.

**BS 2633:1987** Specification for class I arc welding of ferritic steel pipework for carrying fluids (AMD 5798) (AMD 6969) (AMD 9800) (AMD 10065)
Arc welding using manual, semi-automatic or automatic processes; parent metals, welding consumables, preparation for welding, butt joints, branches, attachments, flanges, inspection, acceptance criteria, procedure and welder approval tests.

**BS 2971:1991** Specification for class II arc welding of carbon steel pipework for carrying fluids (AMD 9773)
Document History - Confirmed November 2001
Welding using manual, automatic or semi-automatic processes. Welding consumables, preparation for welding, butt joints, branches, attachments, flanges, testing and inspection, acceptance requirements for optional non-destructive testing, procedure and welder approval tests.

**BS 3604-2:1991** Steel pipes and tubes for pressure purposes: ferritic alloy steel with specified elevated temperature properties. Specification for longitudinally arc welded tubes
Includes specified room and elevated temperature properties.

**BS 4677:1984** Arc welding of austenitic stainless steel pipework for carrying fluids (AMD 5577) (AMD 9767)
Document History - Confirmed November 2001
Arc welding using manual, semi-automatic or automatic processes; parent metals, welding consumables, preparation for welding; butt joints, branches, attachments, flanges; inspection, fault limitations; procedure and welder approval.

**BS 6362:1990** Specification for stainless steel tubes suitable for screwing in accordance with BS 21 'Pipe threads for tubes and fittings where pressure-tight joints are made on the threads'
Document History - Confirmed November 2001
Dimensions and characteristics of seamless and welded austenitic stainless steel tubes with dimensions corresponding to the medium series of ISO 65.

This part of BS 8000 gives recommendations on basic workmanship and covers those tasks which are frequently carried out in relation to above ground drainage and sanitary appliance installation.

**BS 8000-14:1989** Workmanship on building sites. Code of practice for below ground drainage
This part of BS 8000 gives recommendations on basic workmanship on building sites
and covers those tasks which are frequently carried out in relation to below ground drainage.

**BS EN 253:2003** District heating pipes - Preinsulated bonded pipe systems for directly buried hot water networks - Pipe assembly of steel service pipe, polyurethane thermal insulation and outer casing of polyethylene (AMD Corrigendum 14548) (AMD 16014)


Requirements and test methods are given for straight lengths of prefabricated thermally insulated pipe-in-pipe assemblies for directly buried hot water networks, comprising a steel service pipe from DN 20 to DN 1200, rigid polyurethane foam insulation and an outer casing of polyethylene. Only applies to insulated pipe assemblies, for continuous operation with hot water at various temperatures up to 120 °C and occasionally with a peak temperature up to 140 °C.

**BS EN 1092-1:2002** Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, PN designated. Steel flanges (AMD Corrigendum 13960)

Document History - Supersedes BS 4504-3.1:1989. Amendment 13960 is Corrigendum No.1

**BS EN 1092-4:2002** Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, PN designated. Aluminium alloy flanges

Specifies requirements for PN designated circular flanges for pipes, valves, fittings and accessories made from aluminium alloy in the range of DN 15 to DN 600 and PN10 to PN 63

**BS EN 1515-2:2001** Flanges and their joints - Bolting. Classification of bolt materials for steel flanges, PN designated

**BS EN 10216-1:2002** Seamless steel tubes for pressure purposes - Technical delivery conditions. Non-alloy steel tubes with specified room temperature properties (AMD 15150)


**BS EN 10216-2:2002** Seamless steel tubes for pressure purposes - Technical delivery conditions. Non-alloy and alloy steel tubes with specified elevated temperature properties (AMD 15151)


**BS EN 10216-5:2004** Seamless steel tubes for pressure purposes - Technical delivery conditions. Stainless steel tubes

Document History - Supersedes BS 3605-1:1991

Details are given for two test categories for seamless tubes of circular cross section made of austenitic (including creep resisting steel) and austenitic-ferritic stainless steel which are applied for pressure and corrosion resisting purposes at room temperature, at low temperatures or at elevated temperatures.
**BS EN 10217-1:2002** Welded steel tubes for pressure purposes - Technical delivery conditions. Non-alloy steel tubes with specified room temperature properties (AMD 15473)

Covers technical delivery conditions for two qualities TR1 and TR2 of welded tubes of circular cross section.

**BS EN 10220:2002** Seamless and welded steel tubes - Dimensions and masses per unit length

Document History - Supersedes BS 3600:1997

**BS EN 10224:2002** Non-alloy steel tubes and fittings for the conveyance of water and other aqueous liquids - Technical delivery conditions (AMD Corrigendum 14334) (AMD 15787)

Applies to seamless and welded non-alloy steel tubes, end preparation of tubes and fittings for butt welding, fittings fabricated from tube and fittings fabricated from plate or strip.

**BS EN 10255:2004** Non-alloy steel tubes suitable for welding and threading - Technical delivery conditions

Document History - This document is a candidate harmonized European Standard and takes into account the requirements of EC mandate M131 steel tubes and fittings. Supersedes BS 1387:1985
Details are given for requirements of circular non-alloy steel tubes suitable for welding and threading, covering tubes of specified outside diameter 10,2 mm to 165,1 mm (thread size 1/8 to 6) in two series, medium and heavy, and three types of designated thicknesses.

**BS EN 13480-1:2002** Metallic industrial piping. General (AMD 15867)

Specifies the requirements for industrial piping systems and supports, including safety systems, made of metallic materials with a view to ensure safe operation. Applicable to metallic piping above ground, ducted or buried, irrespective of pressure.

**BS EN 13480-2:2002** Metallic industrial piping. Materials (AMD Corrigendum 16363)

Specifies the requirements for materials (including metallic clad materials) for industrial piping and supports manufactured from metallic materials and is currently limited to steels with sufficient ductility. Specifies the requirements for the selection, inspection, testing and marking of metallic materials for the fabrication of industrial piping.

**BS EN 13480-3:2002** Metallic industrial piping. Design and calculation (AMD 16050)

Document History - Supersedes BS 806:1993. Amendment 16050 dated December...
2005
Specifies the design and calculation of industrial metallic piping systems, including supports.

**BS EN 13480-4:2002** Metallic industrial piping. Fabrication and installation (AMD Corrigendum 16365) (AMD Corrigendum 16636)
Specifies the requirements for fabrication and installation of piping systems, including supports

**BS EN 13480-5:2002** Metallic industrial piping. Inspection and testing (AMD Corrigendum 16364) (AMD Corrigendum 16637)
Specifies the requirements for inspection and testing of industrial piping to be performed on individual spools or piping systems, including supports

**BS EN ISO 1127:1997** Stainless steel tubes - dimensions, tolerances and conventional masses per unit length
Document History - Partially supersedes BS 3600:1976

**Copper Development Association**

**Publication 805** Comparison of copper and steel pipework costs for non-domestic installations
Document History - Produced by the UK Copper Board.
Research commissioned by the UK Copper Board into the total installation costs of non-domestic plumbing and heating systems with diameters up to 54mm. Compares copper and black steel tube, and copper and steel fittings.

**Heating and Ventilating Contractors' Association**

**Technical Report TR/5** Welding of carbon steel pipework
Document History - Supersedes 1990 edition
This code of practice is applicable to welds in carbon steel pipework for use with water, steam and gas at pressures up to and including 17.0 bar and/or temperatures from -20°C up to and including 220°C.

**Steel**

**Architects' Journal**

**Stainless steel. AJ 04.05.2006**
Looks at the potential of stainless steel in construction. A supplement sponsored by stainless steel manufacturer Ugine and Alz.
**Metal Works: Dutch buildings. AJ 25.3.04**
A quarterly publication showing the best of steel and aluminium design which is published by The Architects' Journal for Corus.

**British Board of Agreement**

**Certificate 05/4204 Teraspeikko Oy Deltatek. Deltabeam**
Document History - Replaces certificate 03/3989
Relates to Deltabeam, a range of steel beams filled with in-situ concrete, used to support floor slabs.

**British Construcional Steelwork Association**

**Publication 40/05 Galvanizing structural steelwork: An approach to the management of liquid metal assisted cracking**
Document History - Produced by a Working group from BCSA and the Galvanizers Association
Describes the factors contributing to liquid metal assisted cracking (LMAC) and advises inspection routines following galvanisation. Whilst this document primarily deals with structural steelwork, the principles can be applied (with care) to higher strength grades of steel. Discusses the galvanising process, repair, structural design and detailing, types and quality of steel and fabrication.

**BRE**

**Digest 305 Zinc-coated steel**
Zinc corrodes slowly relative to steel because a protective film is formed on its surface. In most atmospheres and many waters, the average rate of attack is about one twenty-fifth that of steel but the rate will vary considerably according to the duration of exposure and the environment. A zinc coating protects steel galvanically and, because it is more electronegative than steel when electrically connected, it provides sacrificial protection. These properties have led to the extensive use of zinc as a protective coating for steel.

**Digest 349 Stainless steel as a building material**
Document History - Replaces - BRE Digest 121
The term stainless steel covers a range of corrosion and heat-resistant iron-based materials which contain at least 10 per cent chromium in addition to one or more other alloying elements. This Digest discussed the three basic classes of stainless steel and indicates the alloys currently most suitable for different building applications. Most metals react with their environment to form an oxide film on the surface. This film may continue to grow, reducing the thickness of metal. On some materials, and stainless steel is one of them, the oxide film provides a complete and visible self-healing protection for the metal within the temperature range to which building components are likely to be subjected.

**Digest 487 Part 2 Structural fire engineering design: materials behaviour - steel**
Part of a suite of related documents containing guidance for the construction industry on structural fire engineering design, and contains information complementary to the existing and emerging fire engineering codes and standards. Each Digest may be used
in isolation or as part of the full integrated suite. Owing to its high thermal conductivity exposed steel will increase in temperature very quickly during a fire, losing strength and stiffness. The designer must ensure that any building will maintain its stability for a reasonable period should any accidental fire occur. Presents the current available design tools to ensure stability of steel framed buildings during a fire.

_Digest 491 Corrosion of steel in concrete: a review of the effect of humidity_
A more robust environmental classification is needed for concrete susceptible to reinforcement corrosion, based on a better understanding of the variation of moisture with depth under changing external conditions and of the resulting rate of corrosion of the steel reinforcement. Reviews recent models and data and presents supplementary information to EN 206 for the UK, based on industry practices and environmental data.

_British Standards Institution_

**BS 4-1:2005 Structural steel sections. Specification for hot-rolled sections**
Document History - Supersedes BS 4-1:1993
Applies to the following hot-rolled structural steel sections: universal beams; universal columns; universal bearing piles; joists; structural tees cut from universal beams; structural tees cut from universal columns; parallel flange channels. Mass, length and depth tolerances for taper flange joists and channels are also given.

Covers the requirements, definitions, steelmaking process, chemical composition, freedom from defects, delivery condition, tests, tensile properties, bending, strain-age-embrittlement, stabilization, formability, hardness, decarburization, retests, surface finishes, edge conditions, inspection, tolerances and marking of flat rolled carbon steel products.

**BS 1449-2:1983 Steel plate, sheet and strip. Specification for stainless and heat-resisting steel plate, sheet and strip (AMD 4807) (AMD 6646) (AMD 8828) (AMD 9648) (No longer current but cited in Building Regulations)**
Document History - Superseded by BS EN 10095:1999 and BS EN 10029:1991 and BS EN 10048:1997 and BS EN 10051:1992 and BS EN 10258:1997 and BS EN 10259:1997. This standard is no longer current but cited in building regulations Flat rolled stainless and heat resisting steel products in coil and cut length form, including plate 3 mm to 100 mm thick, wide strip, sheet from 0.30 mm to less than 3 mm, narrow strip from 0.50 mm to less than 3 mm thick.

This section of BS 5950 gives recommendations for the design of simply supported and continuous composite beams, comprising hot rolled steel sections, plate girders and hollow sections acting compositely with reinforced slab, or with a composite slab complying with BS 5950-4.
**BS 5950-5:1998** Structural use of steelwork in building. Code of practice for design of cold formed thin gauge sections (AMD 16502)


Gives recommendations for the design of cold formed steel sections in simple and continuous construction and its provisions apply to the majority of structures.

**BS 5950-6:1995** Structural use of steelwork in building. Code of practice for design of light gauge profiled steel sheeting (AMD 10239) (AMD 10475)

Gives recommendations for design of light gauge profiled steel sheeting used as roof decking, flooring and roof and wall cladding. Includes design of profiled steel sheeting as permanent formwork for composite slabs.

**BS EN 10020:2000** Definition and classification of grades of steel


**BS EN 10025-1:2004** Hot rolled products of structural steels. General technical delivery conditions

Document History - Supersedes BS EN 10025:1993

Requirements for long and flat products.

**BS EN 10025-2:2004** Hot rolled products of structural steels. Technical delivery conditions for non-alloy structural steels

Document History - Supersedes BS EN 10025:1993

Requirements for long and flat products and semi-finished products which are meant for further processing to flat and long products of hot rolled non-alloy quality steels.

**BS EN 10025-3:2004** Hot rolled products of structural steels. Technical delivery conditions for normalized/normalized rolled weldable fine grain structural steels

Document History - Supersedes BS EN 10113-1:1993 and BS EN 10113-2:1993

Requirements for flat and long products

**BS EN 10025-4:2004** Hot rolled products of structural steels. Technical delivery conditions for thermomechanical rolled weldable fine grain structural steels

Document History - Supersedes BS EN 10113-1:1993 and BS EN 10113-3:1993

Requirements for flat and long products

**BS EN 10025-5:2004** Hot rolled products of structural steels. Technical delivery conditions for structural steels with improved atmospheric corrosion resistance

Document History - Supersedes BS EN 10155:1993

Requirements for flat and long products

**BS EN 10025-6:2004** Hot rolled products of structural steels. Technical delivery conditions for flat products of high yield strength structural steels in the quenched and tempered condition


Requirements for flat products

**BS EN 10027-1:2005** Designation systems for steel. Steel names

Specifies rules for designating steels by means of symbolic letters and numbers to express application and principal characteristics, e.g. mechanical, physical, chemical, so as to provide an abbreviated identification of steels.

**BS EN 10027-2:1992** Designation systems for steels. Steel numbers

**BS EN 10028-1:2000** Flat products made of steels for pressure purposes. General requirements (AMD 14284)
Document History - Supersedes BS EN 10028-1:1993

**BS EN 10028-2:2003** Flat products made of steels for pressure purposes. Non-alloy and alloy steels with specified elevated temperature properties
Document History - Supersedes BS EN 10028-2:1993

**BS EN 10028-3:2003** Flat products made of steels for pressure purposes. Weldable fine grain steels, normalized

**BS EN 10028-4:2003** Flat products made of steels for pressure purposes. Nickel alloy steels with specified low temperature properties
Document History - Supersedes BS EN 10028-4:1995

**BS EN 10028-5:2003** Flat products made of steels for pressure purposes. Weldable fine grain steels, thermomechanically rolled
Document History - Supersedes BS EN 10028-5:1997

**BS EN 10028-6:2003** Flat products made of steels for pressure purposes. Weldable fine grain steels, quenched and tempered
Document History - Supersedes BS EN 10028-6:1997

**BS EN 10028-7:2000** Flat products made of steels for pressure purposes. Stainless steels (AMD Corrigendum 15330)
Includes austenitic creep resisting steels.

**BS EN 10029:1991** Tolerances on dimensions, shape and mass for hot rolled steel plates 3mm thick or above
Specifies requirements for tolerances for hot-rolled non-alloy and alloy steel plates including stainless steels.

**BS EN 10034:1993** Structural steel I and H sections - Tolerances on shape and dimensions

**BS EN 10051:1992** Specification for continuously hot-rolled uncoated plate, sheet and strip of non-alloy and alloy steels - tolerances on dimensions and shape (AMD 9872)
Applies to continuously hot-rolled uncoated flat products with a maximum width of 2200 mm of non-alloy and alloy steels including stainless steels. Also applies to hot-rolled strip for cold rolling.

**BS EN 10056-1:1999** Structural steel equal and unequal leg angles. Dimensions
Document History - Supersedes BS 4848-4:1972

**BS EN 10056-2:1993** Specification for structural steel equal and unequal leg angles. Tolerances on shape and dimensions

**BS EN 10067:1997** Hot rolled bulb flats - dimensions and tolerances on shape, dimensions and mass
Document History - Supersedes BS 4848-5:1980

**BS EN 10079:1993** Definition of steel products
Document History - Supersedes BS 6562-2:1986

**BS EN 10088-1:1995** Stainless steels. List of stainless steels (No longer current but cited in Building Regulations)
Document History - This document is no longer current but is cited in Building Regulations. Superseded by BS EN 10088-1:2005.
This European Standard lists the chemical composition of stainless steels and reference data on some physical properties.

**BS EN 10088-1:2005** Stainless steels. List of stainless steels
Lists the chemical composition of stainless steels, which are subdivided in accordance with their main properties into corrosion resisting steels, heat resisting steels and creep resisting steels

**BS EN 10088-2:2005** Stainless steels. Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes
Document History - Supersedes BS EN 10088-2:1995
For hot or cold rolled sheet/plate and strip of standard grades and special grades of corrosion resisting stainless steels for general purposes.

**BS EN 10088-3:2005** Stainless steels. Technical delivery conditions for semi-finished products, bars, rods, wire, sections and bright products of corrosion resisting steels for general purposes
Document History - Supersedes BS 1554:1990 and BS EN 10088-3:1995
Covers designation, classification, requirements, chemical composition, mechanical properties, surface quality, inspection and testing.

**BS EN 10143:2006** Continuously hot-dip metal coated steel sheet and strip - tolerances on dimensions and shape
Applies to continuously zinc (Z), zinc-iron alloy (ZF), zinc-aluminium alloy (ZA), aluminium-zinc alloy (AZ) and aluminium-silicon alloy (AS) hot-dip coated flat products made of low carbon and high strength steels for cold forming and of structural steels with a minimum thickness of 0,20 mm and a maximum thickness of
6.50 mm, delivered as sheet, wide strip, slit wide strip or cut lengths obtained from slit wide strip or sheet.

**BS EN 10160:1999** Ultrasonic testing of steel flat product of thickness equal or greater than 6 mm (reflection method)
Document History - Supersedes BS 5996:1993

**BS EN 10163-2:2004** Delivery requirements for surface condition of hot-rolled steel plates, wide flats and sections. Plate and wide flats
Applies to the surface condition of hot-rolled plates and surface condition of the faces of wide flats with thicknesses of 3 mm = t = 400 mm.

**BS EN 10163-3:2004** Delivery requirements for surface condition of hot-rolled steel plates, wide flats and sections. Sections
Specifies the delivery requirements for surface condition of sections

**BS EN 10164:2004** Steel products with improved deformation properties perpendicular to the surface of the product - technical delivery conditions
Specifies through thickness properties and associated test methods for flat products and sections of steel.

**BS EN 10210-1:2006** Hot finished structural hollow sections of non-alloy and fine grain steels. Technical delivery conditions
Specifies technical delivery conditions for hot finished hollow sections of circular, square, rectangular or elliptical forms and applies to hollow sections formed hot, with or without subsequent heat treatment, or formed cold with subsequent heat treatment to obtain equivalent metallurgical conditions to those obtained in the hot formed product.

**BS EN 10210-2:2006** Hot finished structural hollow sections of non-alloy and fine grain steels. Tolerances, dimensions and sectional properties
For hot finished circular, square, rectangular and elliptical structural hollow sections, manufactured in wall thicknesses up to 120 mm

**BS EN 10250-4:2000** Open die steel forgings for general engineering purposes. Stainless steels
Specifies the technical delivery requirements for open die forgings, forged bars and products pre-forged and finished in ring rolling mills, manufactured from stainless steels with ferritic, martensitic, austenitic and austenitic-ferritic structures.

**BS EN 10277-1:1999** Bright steel products - technical delivery conditions. General
BS EN 10293:2005 Steel castings for general engineering uses
Covers information to be supplied by the purchaser, designation, manufacturing
process, requirements, testing, identification and marking, packaging and surface
protection. Also offers guidance data on welding

BS EN 10326:2004 Continuously hot-dip coated strip and sheet of structural steels -
Technical delivery conditions
10215:1995

BS EN 10327:2004 Continuously hot-dip coated strip and sheet of low carbon steels
for cold forming - Technical delivery conditions
10215:1995

BS EN 13438:2005 Paints and varnishes - Powder organic coatings for galvanized or
sherardised steel products for construction purposes
Document History - Supersedes BS 6497:1997 which is declared obsolescent but
remains current
Specifies performance requirements for powder coatings applied to galvanized or
sherardised steel products, for architectural (internal and external application), fencing
and construction purposes. Galvanized steel products can be articles batch hot dip
galvanized (galvanized after fabrication) or articles consisting of continuously hot-dip
galvanized sheet which is then subsequently fabricated

BS EN ISO 9013:2002 Thermal cutting - Classification of thermal cuts - Geometrical
product specification and quality tolerances (AMD Corrigendum 14615) (AMD
14956)
Document History - Supersedes BS EN ISO 9013:1995. Amendment 14615 is
Corrigendum No.1
Applies to materials suitable for oxyfuel flame cutting, plasma cutting and laser
cutting.

British Steel Sections, Plates and Commercial Steels

Structural sections in accordance with ASTM specifications

Structural sections to BS 4: Part 1 and BS 4848: Part 4

Design in Steel 4 Castellated and cellular beams
The steel frame is ideally suited to satisfy the most stringent commercial, architectural
and engineering demands for quality, speed, economy and flexibility. This guide is
intended to give the steel designer general guidance on the selection of a long span
floor system based on the use of cellular or castellated beams without the need for
detailed calculations at the scheme design stage.

British Steel Tubes and Pipes
**SHS welding**
This publication covers; product specification; welding practice; manual metal arc welding; semi-automatic welding; end preparation of members; welding procedures and sequences; fillet welds; butt welds; fabrication; and design of welds.

**Design of welded joints - BS 5950 and ENV 1993-1-1-annex K**
This publication has been produced to show how the joint capacity can be calculated and how it can be affected by both the geometric layout and the sizing of the members.

**SHS design to BS 5950: Part 1**

**Design of lattice roof structures in structural hollow sections**
All single storey lattice buildings are made up of a number of component parts. Whilst each part can be identified individually, they must be combined together such that they meet the clients requirements. This publication reviews these individual parts, and presents a solution using structural hollow sections.

**SHS jointing**
This publication covers; butt joints; flange connections; splice joints; end fittings; cleats and brackets; lattice joints; beam to column connections; slab to column connections; and mechanical joints.

**Design Manual for Concrete Filled Columns Part 1 Structural design**
This guide has been prepared to enable designers to use structural hollow sections filled with concrete as structural components in buildings and bridges.

**Chartered Institute of Building**

**Technical Information Sheet 51 Steelwork today**

**CIRIA**

**Guide G 3 Structural action in steel box girders**
A discussion of linear elastic analysis of box girders shows how it can be used to determine shear lag, torsional warping, stresses due to distortion, stresses in multi-box systems, and the limits of elastic behaviour. Next, elastic buckling and post-buckling of plates, caused by longitudinal compression and shear, are dealt with. The determination of buckling strength of panels and webs stiffened by flange plates is explained. Stress distribution in bearing diaphragms is discussed, and the reasons for failure are given. Secondary stresses caused by interaction between flanges and diaphragms, and due to restraint of warping, are explained. The effect of imperfections and residual welding stresses is discussed. Finally, general considerations in applying structural analysis to design in relation to the Merrison Rules are presented.

**Special Publication SP 51 Design for openings in the webs of composite beams**
Document History - This is a jointly published document also by the Steel Construction Institute
This publication deals with the design of simply-supported composite beams with
rectangular openings in the webs. The beams comprise steel I-sections and concrete slabs with steel decking as permanent formwork. Design is based on plastic analysis of the cross-section, considering the moment transfer by Vierendeel action across the opening. A relatively straightforward method of analysis is presented and this is summarised in a step-by-step approach. Comparison with available test data shows that the method is conservative but reasonably accurate. The method can also be used for non-composite and notched beams.

Technical Note TN 102 Web buckling of rolled steel beams
This Technical Note describes a range of tests to determine the web buckling characteristics of rolled steel beams. A small number of beam sizes with relatively slender webs were examined, and the test programme included varying degrees of top flange restraint, together with some cases of load eccentricity. Two distinct types of failure were observed. The first was a flexural - torsional buckling mode involving in plane top flange rotation. The second was characterised by elastic - plastic buckling of the web, the exact form depending upon the external and top flange restraint.

Concrete Society

Concrete Advice 19 Historic reinforcing bars and steel fabric
Provides information on how standards for steel have changed over the years, and covers strengths, identification of reinforcement types, fabric sizes and design stresses.

European Convention for Construction Steelwork

Publication 65 Essentials of Eurocode 3 design manual for steel structures in building
Intended to be a design aid in supplement to the complete document Eurocode 3 - Part 1, to facilitate the use of Eurocode 3 for the design of such steel structures during the provisional formulation of the standard (i.e. when it is an ENV document).

Publication 71 Examples to Eurocode 3
Design examples prepared by the ECCS as a design aid in supplement to the complete EC3/1, to facilitate the use of EC3/1 for the design of steel buildings. The design examples are those thought likely to be needed for daily practical design work.

Publication 72 Composite beams and columns to Eurocode 4
Presents useful information and worked examples on the design of composite beams and columns to Eurocode 4. The information is given in the form of a concise guide on the relevant aspects of Eurocode 4 that affect the design of composite beams and columns normally encounters in general building construction. Reviews the general principles, gives design formulae and makes cross reference to the relevant clauses of Eurocode 4.

Publication 73 Good construction practice for composite slabs
Provides good practice guidelines for both European countries where composite construction is common and where such construction shall be undertaken in the future.
Publication 75 Fire safety in open car parks: Modern fire engineering
Aims to resolve discrepancies between European countries' fire safety requirements for open car parks based on information and test results available throughout the world. Findings should allow regulatory bodies to set up safe and economic rules for the design of open car parks.

Publication 81 Bridges in steel - the use of weathering steel in bridges
All steels rust at a governed rate, but as this rusting continues the oxide layer becomes a barrier - slowing corrosion, almost to zero in some instances. Weathering steel achieves this stable condition in a few years, after which, with regular inspection, the life of the structure can be indefinite.

Publication 82 Fire design information sheets
The fire resistance of a steel section depends upon a number of factors: size and shape, load bearing capacity, position in relation to non combustible materials such as masonry and concrete. Looks at section factors, and fire protection methods available for a variety of steel construction cross sections.

Publication 84 Multi storey buildings in steel - car parks
Gives examples of good practical design for car parks, which enable them to blend in with local environments and show the versatility and economy of a steel frame. Includes European case studies.

Publication 85 Design handbook for braced or non sway steel buildings according to Eurocode 3
Intended to be a design aid in supplement to the complete document Eurocode 3 - Part 1.1, in order to facilitate the use of Eurocode 3 for the design of such steel structures which are usual in common practice: braced or non sway steel structures. Covers; Elastic global analysis of structures in steel and Checks of structural members and connections at limit states.

Publication 89 Fire resistance of steel structures (on the basis of ENV 1993-1.2:1995)
The assessment of fire resistance of structural elements is based either on standard fire tests in furnaces or on calculation. This publication describes calculation methods for unprotected and protected internal steelwork, based upon the European Prestandard ENV 1993-1.2:1995.

Publication 96 Design handbook for braced composite steel-concrete buildings according to Eurocode 4
Intended to be a design aid in supplement to ENV 1994-1-1:1992. It provides simplified guidance and facilitates the use of Eurocode 4 for the design of composite structures in common practice: braced composite steel-concrete structures. Contains additional explanations on design principles, application rules and, usual design results.

Publication 105 Good design practice: a guideline for fatigue design
Designed for project managers in design offices, engineers in steel construction companies and construction survey engineers concerned with the manufacture of structures subjected to fatigue loads induced by frequently changing actions, traffic actions, wind induced oscillations or comparable actions. Contains a review of the
current knowledge in fatigue design and the fabrication of fatigue resistant structures. Contains information about design that is in conformity with the currently available Eurocode 3, which deal with the design of steel structures. Furthermore, it contains information about fabrication aspects not covered in the Eurocodes, and should be viewed as a source of advice to be consulted before designing, fabricating, or repairing a structure subjected to fatigue.

Publication 115 European recommendations for sandwich panels. Part 1: Design Recommendations applying to roof or wall cladding, ceiling and internal wall panels in the form of a sandwich in which the inner and outer faces are formed from thin metal sheets and the core is relatively low density material having both stiffening and insulating properties. The document as a whole is concerned with structural sandwich panels designed to resist such external loading conditions as wind and snow.

Galvanizers' Association

Engineers and architects' guide to hot dip galvanizing This guide details the protection given by hot dip galvanizing, where and how to use it and how to specify it. There is also information on the process itself and the economic advantages of galvanizing.

National Federation of Roofing Contractors

Technical Bulletin 11 Flat metal composite wall panels This bulletin provides information on flat metal composite wall panels.

Steel Construction Institute


Publication 055 Design of composite slabs and beams with steel decking Presents a method of design consistent with BS 5950: Part 1 and Part 3.1 for simply supported composite beams as used in buildings. A total of 71 design tables for both uniform and point load cases are included to aid selection of steel beam sizes depending on span and loading, depth of the concrete slab and shape of the deck profile used. A worked example illustrates the design of a typical composite beam.

Publication 057 Design of members subject to combined bending and torsion Document History - Reprinted - 1997 This report is concerned with the minority of cases, where the load on a member is eccentric to the shear centre. The publication is chiefly concerned with providing guidance for the design of hot rolled open sections, but, guidance on the design of hot rolled tubular sections is also given.

Publication 059 Design of fabricated composite beams in buildings Provides guidance on the design, manufacture and use of fabricated composite beams,
a form of construction particularly suited to longer-span commercial buildings. Different shapes and layouts of fabricated beams are covered, together with details of modern manufacturing processes. The importance of initial design considerations and their relevance to economy of construction are discussed. A detailed design method consistent with BS 5950: Part 1 and Part 3.1 is provided, illustrated by a worked example.

**Publication 060 Design of haunched composite beams in buildings**
Present a method of design for haunched composite beams. Two approaches to determining global moments and forces in the structure are described using either elastic or plastic hinge analysis. Individual analysis of the composite sections and haunched section is also covered. Lateral stability of the beams both in construction and in service is discussed and serviceability calculations made for deflection, stresses and vibration response. Detailed design procedures are given, including those for connections.

**Publication 078 Commentary on BS 5950: Part 3: Section 3.1 'Composite beams'**
Covers the background to the Code and an explanation of its requirements in depth. The principles behind designing both simply supported and continuous composite beams are discussed, and comprehensive step-by-step procedures given for their design.

**Publication 083 Design of composite trusses**
Covers the design of long span steel trusses acting compositely with a concrete or composite slab. The method of design conforms to BS 5950: Parts 1 and 3 in the non-composite and composite conditions respectively. A fully worked example of a composite truss is included which illustrates the design principles. Details of the connections between the elements and members are also presented.

**Publication 093 Lateral stability of steel beams and columns - common cases of restraint**
The common problems of lateral instability of beams and columns are examined, giving advice on the use of BS 5950: Part 1 and other guidance for determining the buckling resistance of these members. The first section covers the theory of elastic stability of beams and columns. The second section presents common cases that are encountered in building construction.

**Publication 100 Design of composite and non-composite cellular beams**
Present design methods for simply supported steel and composite cellular beams (with circular openings) as used in buildings. The design methods, consistent with BS 5950: Parts 1 and 3.1, are illustrated by a worked example.

**Publication 102 Connections between steel and other materials - interfaces**
Many building and refurbishment projects require structural connections between steelwork and other materials, such as concrete or masonry. This publication examines the design and construction issues implicit in these connections, and presents a range of details. Each detail is appraised in terms of its structural performance and construction qualities, and an indication is given of where the detail may appropriately be used. There are many factors that influence the form of connection details, and these vary considerably from project to project. Details are
therefore presented as schematic arrangements that may be adapted to suit the requirements of individual projects.

**Publication 118 Design of stub girders**

Presents a design method for stub girders consistent with BS 5950: Part 3. The basis of design is simplified by considering that the steel bottom chord resists tension (arising from bending action), vertical shear, and local (Vierendeel) moments across the opening. The design method is compared with the results of three full-scale tests on stub girders and is shown to be conservative but reasonably active. A detailed worked example illustrating the design procedure is included.

**Publication 121 Composite beam design to Eurocode 4**

This publication reviews the method of design of composite slabs and beams to BS ENV 1994 Eurocode 4: Part 1.1, which is based on plastic section analysis principles for Class 1 and 2 sections. Design tables are presented to aid quick selection of the steel beams. Generic deck profiles are used to cover the main design cases for uniformly and point loaded composite beams.

**Publication 123 Concise guide to the structural design of stainless steel (2nd ed)**

This guide is based on BS 5950: Part 1 and provides guidance on the extension of the code for the design of stainless steel structures. This second edition extends its use to cover the standard carbon austenitic stainless steel grades 304 and 316.

**Publication 125 Building design using cold formed steel sections: worked examples to BS 5950: Part 5: 1987**

Covers the detailed design of beams, columns and trusses in accordance with BS 5950: Part 5: 1987. Worked examples illustrate the practical design of beams and columns with different loading and boundary conditions, and have been selected to be representative of members used in a real building. Connections between the various members are also designed and detailed in order to demonstrate the use of these sections in practice. Section properties are tabulated for generic C sections, which are representative of those available from a range of manufacturers. Worked examples of the calculation of these properties are included in Appendix A.

**Publication 128 Building design using cold formed steel sections: acoustic insulation**

This publication gives detailed guidance on the construction and acoustic performance of internal floors and walls using cold formed steel sections, and more general advice on the acoustic insulation of a variety of external walls using steel cladding or framing systems. The principles of sound insulation and performance requirements of modern buildings are covered. A range of generic floor and wall types is examined, and their suitability for use in domestic, commercial and other types of building is discussed. Performance Tables are included giving sound insulation values for the different systems.

**Publication 150 Design for manufacture guidelines**

This document is aimed at bringing a degree of understanding of the manufacturing implications to the early design phases of a project. Subjects covered include: Fabrication processes, Materials Grade and Section Selection, Connection Design Considerations, Fabrication Classification and Costing, Bolts and Bolting, Welding and Inspection, Corrosion Protection, Trusses and Lattice Girders, and Transportation.
**Publication 152** Section property and member capacity tables for cold-formed stainless steel
The aim of this publication is to provide design guidance and information to assist engineers in designing cold-formed stainless steel sections for use as structural members in both onshore and offshore construction. A comprehensive set of Design Tables is presented giving gross and effective section properties, section classification and member capacities for the wide range of cold-formed stainless steel sections. The structural forms covered by the Design Tables are rectangular and square hollow sections, channels, double channels back to back, equal angles, and double equal angles back to back. The grades of stainless steel covered are austenitic stainless steel grades 304, 316 and low carbon 316L, and also duplex 2205. This publication will greatly facilitate the design process for structural cold-formed stainless steel sections and thereby encourage more competitive design.

**Publication 158** Section properties and member resistances to Eurocode 3 (UB, UC and hollow sections)
This design guide presents tables for column and beam design to DD ENV 1993-1-1: Eurocode 3: Design of steel structures: Part 1.1 General rules and rules for buildings. Design tables are presented for universal beams and universal columns and for structural hollow sections. Explanatory notes are presented, giving the background to the classification and the properties and resistances in the design tables. Worked examples for a beam and a column are included, illustrating the design of typical steel sections using the design tables including the modification of values.

**Publication 164** Design of steel portal frames for Europe
Provides guidance on the design of steel portal frame buildings to both the specifier and the designer. It is targeted at the single storey construction market in continental Europe, and Eurocode 3 (ENV 1993-1-1) has been chosen for the basis of calculations to exploit the opportunity it provides for a commonly accepted design standard. Addresses the conceptual decisions that must be made to specify a portal frame building that will satisfy the clients requirements, and guides the designer through the principles of design of portal frames to Eurocode 3. Contains worked examples for both plastic portal and elastic portal design. Appendices present the detailed requirements of the Eurocode and list important differences between UK practice and the European requirements.

**Publication 165** Building design using cold formed steel sections: Construction detailing and practice
This publication provides information and guidance on the construction of light steel frames in general building applications in both the domestic and commercial building markets. Light steel framing systems use galvanized cold formed steel sections as the primary structural components.

**Publication 166** Design of steel framed buildings for service integration: interfaces
Summarises an investigation of the design of structural systems in modern commercial buildings which the facility for integration of the structure and building services within the same floor zone. Reviews the general requirements for building services, especially air conditioning, the utilisation of the principles of composite construction for designs of 15m, and the distribution of air conditioning ducts with respect to the structural systems considered in the investigation. Also makes general
estimates of construction costs, taking into account the influence of the costs of service distribution and other variable aspects of the construction process.

**Publication 174 Role of steel in environmentally responsible buildings**

The purpose of this publication is to inform designers of the role that steel can play in improving the environmental performance of buildings. The document sets out the merits of steel in the context of the building industry's impact on the environment and illustrates how the use of steel components and structures can help to improve the environmental performance of both an individual building and the whole construction industry.

**Publication 179 Architects' guide to stainless steel**

Contains information on the design, specification, manufacture and maintenance of stainless steel architectural components in two sections: Design and Technology and Case Studies. Section one includes structural and performance information and reviews production and finishing processes. It focuses on those grades of stainless steel and techniques that are commonly used in relation to architectural components. The second section provides an overview of the contemporary use of stainless steel in architecture. It comprises a broad and representative selection of building projects by leading architects and engineers.

**Publication 202 Steelwork design guide to BS 5950-1:2000. Volume 1 section properties, member capacities. 6th edition (incorporating amendment 1) | Part 0 - Contents (1 of 6)**

Document History - Produced in conjunction with the British Constructional Steelwork Association (BCSA). This document is part of a larger document, Steelwork design guide to BS 5950-1:2000. Volume 1, which has been split into parts for ease of use.

The Blue Book is an essential tool for steel designers, giving section properties and member capacities in tabular form for use in design to BS 5950-1:2000. The amendments to BS 5950-1 have resulted in significant technical changes to the rules to which steelwork is designed. This has resulted in numerous changes to member capacities and resistances. In addition to utilising the effective section properties in the member capacity calculations, the Blue Book includes a new set of tables that give the effective section properties for members subject to different loading conditions. Other additions include parallel flange channels, asymmetric beams and deep Universal Beams.


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the member capacity calculations, the Blue Book includes a new set of tables that give the effective section properties for members subject to different loading conditions. Other additions include parallel flange channels, asymmetric beams and deep Universal Beams.

Publication 202 Steelwork design guide to BS 5950-1:2000. Volume 1 section properties, member capacities. 6th edition (incorporating amendment 1) | Part B1 - Tables of dimensions and gross section properties: yellow pages (3 of 6)

Document History - Produced in conjunction with the British Constructional Steelwork Association (BCSA). This document is part of a larger document, Steelwork design guide to BS 5950-1:2000. Volume 1, which has been split into parts for ease of use.

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Publication 202 Steelwork design guide to BS 5950-1:2000. Volume 1 section properties, member capacities. 6th edition (incorporating amendment 1) | Part C (S275) - Member capacity tables: pink pages (5 of 6)

Document History - Produced in conjunction with the British Constructional Steelwork Association (BCSA). This document is part of a larger document, Steelwork design guide to BS 5950-1:2000. Volume 1, which has been split into parts for ease of use.

The Blue Book is an essential tool for steel designers, giving section properties and member capacities in tabular form for use in design to BS 5950-1:2000. The amendments to BS 5950-1 have resulted in significant technical changes to the rules to which steelwork is designed. This has resulted in numerous changes to member
capacities and resistances. In addition to utilising the effective section properties in
the member capacity calculations, the Blue Book includes a new set of tables that give
the effective section properties for members subject to different loading conditions.
Other additions include parallel flange channels, asymmetric beams and deep
Universal Beams.

**Publication 202** Steelwork design guide to BS 5950-1:2000. Volume 1 section
properties, member capacities. 6th edition (incorporating amendment 1) | Part D
(S355) - Member capacity tables: green pages (6 of 6)
Document History - Produced in conjunction with the British Constructional
Steelwork Association (BCSA). This document is part of a larger document,
Steelwork design guide to BS 5950-1:2000. Volume 1, which has been split into parts
for ease of use.
The Blue Book is an essential tool for steel designers, giving section properties and
member capacities in tabular form for use in design to BS 5950-1:2000. The
amendments to BS 5950-1 have resulted in significant technical changes to the rules
to which steelwork is designed. This has resulted in numerous changes to member
capacities and resistances. In addition to utilising the effective section properties in
the member capacity calculations, the Blue Book includes a new set of tables that give
the effective section properties for members subject to different loading conditions.
Other additions include parallel flange channels, asymmetric beams and deep
Universal Beams.

**Publication 207** Joints in steel construction: moment connections | Part 1 - Moment
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Document History - Published in association with the British Constructional Steel
Association (BCSA). This 3rd reprint published - 1997 (with amendments). First
published - 1995. This document is part of a larger document, Joints in steel
construction: moment connections, which has been split into parts for ease of use.
Provides method for designing the following types of moment resisting connections in
steel framed structures: Beam to column - Bolted end plates, Wind moment
connections and Shop and site welded connections, Beam - Bolted splices and
Welded splices, Columns - Bolted splices, Welded splices and Bases. This publication
does not cover connections subject to seismic loading.

**Publication 207** Joints in steel construction: moment connections | Part 2 - Capacity
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Document History - Published in association with the British Constructional Steel
Association (BCSA). This 3rd reprint published - 1997 (with amendments). First
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construction: moment connections, which has been split into parts for ease of use.
Provides method for designing the following types of moment resisting connections in
steel framed structures: Beam to column - Bolted end plates, Wind moment
connections and Shop and site welded connections, Beam - Bolted splices and
Welded splices, Columns - Bolted splices, Welded splices and Bases. This publication
does not cover connections subject to seismic loading.

**Publication 212** Joints in steel construction: Simple connections (includes
corrigendum 1 October 2002) | Part 24 - Appendix H Capacity tables, dimensions for
detailing and general data - Dimensions for detailing (25 of 26)
Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.

Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 25 - Appendix H Capacity tables, dimensions for detailing and general data - Section dimensions and properties (26 of 26)

Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.

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double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 1 - Introduction (2 of 26)
Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction; Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.
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Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 2 - Standardised connections (3 of 26)
Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction; Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.
Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 3 - Beam-to-beam and beam-to-column connections (4 of 26)
Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction; Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.
Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 4 - Double angle web cleats (5 of 26)

Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.

Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 5 - Flexible end plates (6 of 26)

Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.

Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 6 - Fin plates (7 of 26)

Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This
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Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

**Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 7 - Column splices (8 of 26)**

Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.

Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

**Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 8 - Column bases (9 of 26)**

Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.

Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.
Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 9 - Bracing connections (10 of 26)

Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.

Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 10 - Special connections (11 of 26)

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Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 11 - References (12 of 26)

Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.

Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.
double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 12 - Bibliography (13 of 26)

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Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 14 - Appendix H Capacity tables, dimensions for detailing and general data - Contents (15 of 26)

Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.
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Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 15 - Appendix H Capacity tables, dimensions for detailing and general data - Standard fittings (16 of 26)
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Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollo-Bolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 16 - Appendix H Capacity tables, dimensions for detailing and general data - Double angle web cleats (17 of 26)
Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.

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Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 17 - Appendix H Capacity tables, dimensions for detailing and general data - Flexible end plates (18 of 26)
Gives design guidance for structural steelwork connections for use in buildings designed using the simple method, in accordance with BS 5950-1:2000. Following on from previous work, it also covers a wider range of simple joints, design guidance for bolted connections to hot finished structural hollow sections using Flowdrill or Hollobolts, use of fin plates for deep beams, design procedures for double lines of bolts in double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 18 - Appendix H Capacity tables, dimensions for detailing and general data - Fin plates (19 of 26)

Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.

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Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 19 - Appendix H Capacity tables, dimensions for detailing and general data - Universal column - bearing type splices (20 of 26)

Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.

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double angle web cleats and fin plates, improved structural integrity guidance, use of fully threaded bolts, inclusion of bracing connections and slotted and kidney shaped holes.

Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 20 - Appendix H Capacity tables, dimensions for detailing and general data - Hollow section tension splices (21 of 26)

Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.

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Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 21 - Appendix H Capacity tables, dimensions for detailing and general data - Column bases (22 of 26)

Document History - Design guidance for a range of simple connections was originally published in two separate volumes entitled Joints in simple construction: Volume 1: Design Methods (P205) and Volume 2: Practical Applications (P206/92). This document supersedes P205 and P206. Includes Corrigendum No1. dated October 2002. Jointly published with the BCSA. This document is part of a larger document, Joints in steel construction: Simple connections and includes corrigendum 1 October 2002, which has been split into parts for ease of use.

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Publication 212 Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 22 - Appendix H Capacity tables, dimensions for detailing and general data - Material strengths (23 of 26)

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Publication 212. Joints in steel construction: Simple connections (includes corrigendum 1 October 2002) | Part 23 - Appendix H Capacity tables, dimensions for detailing and general data - Fastener capacities (24 of 26)

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Publication 213. Joints in steel construction: composite connections

Document History - Produced in conjunction with the British Constructional Steelwork Association (BCSA).

Considers connections in frames where steel beams act compositely with concrete floor slabs, the structural interaction of the beams and slabs allows smaller beams to be used in a frame of given stiffness and strength. Shear connectors provide the means of enhancing moment capacity and stiffness by transferring longitudinal shear.

Publication 252. Design of single-span steel portal frames to BS 5950-1:2000

Gives an introduction to the design of single-span steel portal frames and brings together existing design guidance on this common form of construction.

Publication 287. Design of composite beams using precast concrete slabs

Document History - This project was part-funded by the DETR under the Partners in Innovation initiative (project contract number CI 38/10/77), and by The Corus Construction Centre and the Precast Flooring Federation.

Covers forms of construction, practical considerations, design of composite beams, design of floor slabs, construction considerations, Slimflor construction and load span tables for initial sizing.
Document History - This document is part of a larger document, In-plane stability of portal frames to BS 5950-1:2000, which has been split into parts for ease of use. This document details the essential calculation methods used for in-plane stability in single-storey portal frames. These are designed using plastic or elastic analysis and are part of the ultimate limit state verifications. Covering stability checks, sway-check method, amplified moments method, second-order analysis, member checks and worked examples.

Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 6 - Member checks (7 of 17)
Document History - This document is part of a larger document, In-plane stability of portal frames to BS 5950-1:2000, which has been split into parts for ease of use. This document details the essential calculation methods used for in-plane stability in single-storey portal frames. These are designed using plastic or elastic analysis and are part of the ultimate limit state verifications. Covering stability checks, sway-check method, amplified moments method, second-order analysis, member checks and worked examples.

Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 7 - References (8 of 17)
Document History - This document is part of a larger document, In-plane stability of portal frames to BS 5950-1:2000, which has been split into parts for ease of use. This document details the essential calculation methods used for in-plane stability in single-storey portal frames. These are designed using plastic or elastic analysis and are part of the ultimate limit state verifications. Covering stability checks, sway-check method, amplified moments method, second-order analysis, member checks and worked examples.

Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 8 - Appendix A - Second-order analysis of common portals 'by hand' (9 of 17)
Document History - This document is part of a larger document, In-plane stability of portal frames to BS 5950-1:2000, which has been split into parts for ease of use. This document details the essential calculation methods used for in-plane stability in single-storey portal frames. These are designed using plastic or elastic analysis and are part of the ultimate limit state verifications. Covering stability checks, sway-check method, amplified moments method, second-order analysis, member checks and worked examples.

Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 9 - Appendix B - Second order analysis of tied portals 'by hand' (10 of 17)
Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 10 - Appendix C - Effective stiffness of members (11 of 17)

Document History - This document is part of a larger document, In-plane stability of portal frames to BS 5950-1:2000, which has been split into parts for ease of use. This document details the essential calculation methods used for in-plane stability in single-storey portal frames. These are designed using plastic or elastic analysis and are part of the ultimate limit state verifications. Covering stability checks, sway-check method, amplified moments method, second-order analysis, member checks and worked examples.

Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 11 - Appendix D - Deflections from horizontal loads for 'hand' second-order calculations (12 of 17)

Document History - This document is part of a larger document, In-plane stability of portal frames to BS 5950-1:2000, which has been split into parts for ease of use. This document details the essential calculation methods used for in-plane stability in single-storey portal frames. These are designed using plastic or elastic analysis and are part of the ultimate limit state verifications. Covering stability checks, sway-check method, amplified moments method, second-order analysis, member checks and worked examples.

Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 12 - Appendix E - Hinge deflections by interpolation (13 of 17)

Document History - This document is part of a larger document, In-plane stability of portal frames to BS 5950-1:2000, which has been split into parts for ease of use. This document details the essential calculation methods used for in-plane stability in single-storey portal frames. These are designed using plastic or elastic analysis and are part of the ultimate limit state verifications. Covering stability checks, sway-check method, amplified moments method, second-order analysis, member checks and worked examples.

Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 13 - Worked Example 1 - Single span roof portal frame (14 of 17)

Document History - This document is part of a larger document, In-plane stability of portal frames to BS 5950-1:2000, which has been split into parts for ease of use. This document details the essential calculation methods used for in-plane stability in single-storey portal frames. These are designed using plastic or elastic analysis and are part of the ultimate limit state verifications. Covering stability checks, sway-check method, amplified moments method, second-order analysis, member checks and worked examples.
Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 14 - Worked Example 2 - Tied portal frame (15 of 17)

Document History - This document is part of a larger document, In-plane stability of portal frames to BS 5950-1:2000, which has been split into parts for ease of use. This document details the essential calculation methods used for in-plane stability in single-storey portal frames. These are designed using plastic or elastic analysis and are part of the ultimate limit state verifications. Covering stability checks, sway-check method, amplified moments method, second-order analysis, member checks and worked examples.

Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 15 - Worked Example 3 - Two-span portal frame (16 of 17)

Document History - This document is part of a larger document, In-plane stability of portal frames to BS 5950-1:2000, which has been split into parts for ease of use. This document details the essential calculation methods used for in-plane stability in single-storey portal frames. These are designed using plastic or elastic analysis and are part of the ultimate limit state verifications. Covering stability checks, sway-check method, amplified moments method, second-order analysis, member checks and worked examples.

Publication 292 In-plane stability of portal frames to BS 5950-1:2000 | Part 16 - Worked Example 4 - Two-span portal frame with hit/miss internal columns (17 of 17)

Document History - This document is part of a larger document, In-plane stability of portal frames to BS 5950-1:2000, which has been split into parts for ease of use. This document details the essential calculation methods used for in-plane stability in single-storey portal frames. These are designed using plastic or elastic analysis and are part of the ultimate limit state verifications. Covering stability checks, sway-check method, amplified moments method, second-order analysis, member checks and worked examples.

Publication 300 Composite slabs and beams using steel decking: best practice for design and construction

Document History - Published in conjunction with the Metal Cladding and Roofing Manufacturers Association and also known as MCRMA Technical Paper 13. Updates the SCI Pub, Good practice in composite floor construction, 1990 and is based on SCI Pub, Design of composite slabs and beams with steel decking, 1989. Important notice: Site practice, particularly with regard to safety and the use of nets to prevent falls, has moved-on since this publication was written.

Looks at design and construction issues of composite slabs and beams. Covers steel decking, composite slabs, acoustic insulation, construction practice for decking and concrete and slim floor construction.

Publication 304 Guide to the major amendments in BS 5950-1:2000

BS 5950-1:2000 Structural use of steelwork in building. Code of practice for design - Rolled and welded sections, has undergone major amendment. Almost every Clause of the Standard has changed, some of the changes are technical in nature, others are editorial and do not alter recommendations for building design. Guides designers through the major technical amendments. A short description of each important change is provided, and simple worked examples illustrate revised design procedures. The revised Standard, BS 5950-1:2000, became effective on 15 August 2001.
Publication 334 Design of multi storey braced frames
Covers the design of braced, steel-framed multi-storey buildings, and offers guidance on the structural design of the superstructure. Detailed guidance is given on the application of the frame stability checks specified in BS 5950-1:2000, and how the Standard directs that any significant second-order effects may be allowed for. Details are given for the common floor systems used in most multi-storey structures, providing typical framing layouts, typical member sizes and construction depths.

Publication 335 H-pile design guide
Provides guidance on the selection, design and installation of steel H-piles and UC section plunge columns for foundations to all types of structure. Current practice and experience in this field are presented and discussed, and recommendations are given. Describes characteristics and advantages of steel bearing piles to assist in selection of the correct pile type for any given site and soil conditions. Load transfer mechanisms are described and limit state design methods applied in line with the new Eurocodes.

Publication 336 Acoustic detailing for multi storey residential buildings
Provides guidance on acoustic details for steel framed residential buildings. Details are given for the junction of external walls with separating floors and separating walls with separating floors. The floor constructions included are in-situ concrete slabs with shallow profiled metal deck supported on hot-rolled steel sections, in-situ concrete slabs with deep profiled metal deck supported on ASB (Asymmetric Beams) or RHS edge beams and precast concrete units supported on hot-rolled steel sections. The wall constructions included are light steel framing and masonry blockwork.

Publication 338 Quicon® - Design guide to BS 5950-1
Introduces the system, looks at the design model, gives standard details including components, connections and fabrication and provides design tables.

Document History - Supersedes RT983.
Provides conservative generic guidance applicable to any intumescent coating. Guidance applies to both composite and non-composite beams.

Steel sheets

Architects' Journal

Steel sheet goes structural. AJ 5.10.95