
British Standard
Construction drawing practice

Part 1. Recommendations for general principles

Dessins de construction
Partie 1. Principes généraux — Recommandations

Bauzeichnungen
Teil 1. Empfehlungen für allgemeine Grundsätze

Foreword

This British Standard, having been prepared under the direction of the Basic Data and Performance Criteria for Civil Engineering and Building Structures Standards Committee, is a revision of BS 1192 : 1969 which is withdrawn. It has been written to bring the recommendations for construction drawing practice up to date and to comply with other national standards of the United Kingdom and with standards of the International Organization for Standardization (ISO) that have been accepted by the UK.

The standard will comprise four Parts as follows.

Part 1 Recommendations for general principles

Part 2 Recommendations for architectural and engineering drawings* †

Part 3 Recommendations for symbols and conventions†

Part 4 Recommendations for landscape drawings

It gives recommendations regarding the production of graphical material needed to provide communication, with accuracy, clarity, economy and consistency of presentation, between all concerned with the construction industry; including architects, civil engineers, contractors, landscape architects, services engineers, site operatives and structural engineers.

BS 1192 : 1969 was reviewed by BSI Technical Committee B/61, Architectural and Building Drawing Office Practice, in 1974 when there was considerable activity concerning drawing practice at an international level. The relevant international work (within ISO) was not however sufficiently advanced to justify the revision of the standard at that time.

ISO work. Many of the more industrialized countries of the world have participated in the work within ISO relating to drawing practice, each country using its own drawing standards as working documents. In view of such a wide coverage it was inevitable that differing opinions would be expressed, but the various attitudes of the countries were reconciled by consensus and by the adoption of the most appropriate method for each aspect of construction drawing practice.

Relevant ISO standards are referred to, or have been incorporated into this standard, when appropriate and when they have been approved by the United Kingdom.

The ultimate objective of international standardization work regarding construction drawing practice is the formation of a universal drawing language, just as, in a different context, musical notation is now accepted internationally.

Projection systems. For the first time, and with international agreement, three-dimensional projection systems have been rationalized and, when applicable, have been allocated standardized angles, axes and related scales. The opportunity has also been taken to resolve certain common and persistent misunderstandings, such as the confusion between the words 'axonometric' and 'planometric', and between 'orthogonal' and 'orthographic' projections.

Figures. The figures illustrate the text and have no other significance.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

*BS 308 gives recommendations for engineering drawings in industries that are unconnected with the construction industry and that are associated with mechanical, electrical, electronic, hydraulic, pneumatic and nuclear engineering disciplines.

†In course of preparation.

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Construction drawing practice
Part 1. Recommendations for general principles

AMD 7031

Deletion

AMD 7031
June 1992.

Clause 20.1 General

In paragraph 3, delete 'When no tolerance is given either in the specification or on the drawings, it should be understood that the relevant permitted deviation in tables 2 or 3 of BS 5606 : 1978 applies.'

9206

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Contents

	Page		Page
Foreword	Inside front cover	5 Types of lines	11
Committees responsible	Back cover	6 Expression of linear dimensions on drawings	23
		7 Heights of letters and numerals	25
Section one. General		Figures	
1 Scope	2	1 Layout of drawing sheets	8
2 Definitions	2	2 Examples of size and position of title and information panels	9
3 Range of drawings	4	3 Termination of leader lines	11
Section two. Production of drawings		4 Plan: structural grid, based on centre lines of columns	12
4 Information	5	5 Grid using co-ordinates	12
5 Function of each drawing and its place in the set	5	6 Offset grid	13
6 Schedules	5	7 Modular grid with completed divisioning	13
7 Referencing of drawings	5	8 Tartan grid	13
8 Checking procedures	6	9 Comparison of projection methods	14
9 Revision of drawings	6	10 Central projection	17
10 Record of drawings	6	11 Identification of storeys and levels (general)	18
Section three. Presentation of drawings		12 Identification of storeys, floors and decks (with mezzanine)	18
11 Drawing sheets	7	13 Identification of storeys and floors (irregular formation)	19
12 Scales	10	14 Section through a building, showing floor levels and a temporary bench mark (TBM) as a datum	20
13 Lines	10	15 Emphasis by outline	20
14 Grids	10	16 Emphasis by hatching (or shading)	21
15 Projection systems	15	17 Limiting of hatching (or shading) to zones near outlines	21
16 Identification of storeys, rooms, other areas and features	18	18 Interruption of hatching (or shading) for lettering	21
17 Levels	19	19 Separation of areas filled in solidly	21
18 Emphasis upon significant areas	20	20 Running dimensions	22
19 Sizes	22	21 Position of arrowheads	23
20 Methods for indicating tolerance requirements on construction drawings	23	22 Examples of tolerances on size dimensions	24
21 Lettering	25	23 Examples of tolerances on location dimensions	24
22 Folding of prints	25	24 Orientation of lettering	25
Tables		25 Examples of folding of prints	26
1 Drawing sheet sizes; first preference	7	26 Examples of folding of prints for filing	27
2 Drawing sheet sizes; second preference	7		
3 Drawing sheet sizes; third preference	7	Index	28
4 Metric scales	10		

General

1 Scope

This Part of this standard gives recommendations for general principles for the preparation of all drawings for the construction industry, including schedules prepared on drawing sheets and numbered as one of a drawing set. It is applicable to drawings produced by computer techniques, and to drawings that will be reproduced by microfilming in accordance with BS 5536.

NOTE. The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this Part of BS 1192, the following definitions apply.

NOTE 1. See also BS 3589, ISO 1046 and ISO 1791.

NOTE 2. Terms given in italic typescript are defined in this standard.

2.1 assembly. Aggregate of *components* used together.

NOTE. This definition is different from that given in BS 2900.

2.2 assembly drawing. *Drawing* showing details of construction or of joints.

NOTE. This definition is identical with that given in ISO 1046.

2.3 axonometric projection. *Orthogonal projection* methods on a single *projection plane*.

NOTE. See *isometric*, *dimetric* and *trimetric projections* and figure 9.

2.4 block plan. *Plan* to identify a site and locate the outlines of a construction in relation to a town plan or other context.

NOTE. This definition is different from that given in ISO 1046.

2.5 brief. Statement of a client's requirements for a project.

2.6 cabinet projection. *Oblique projection* in which the projections of the Y and Z axes are respectively horizontal and vertical, and the projection of the X axis is, by international agreement, at 45° upward and to the right from the intersection of the projections of the Y and Z axes. The *scale* of the projected X axis is half that of the projected Y and Z axes (see figure 9).

2.7 cavalier projection. *Oblique projection* in which the projections of the Y and Z axes are respectively horizontal and vertical, and the projection of the X axis is, by international agreement, at 45° upward and to the right from the intersection of the projections of the Y and Z axes. The *scales* of all three projected axes are identical (see figure 9).

2.8 component. Product formed as a distinct unit, having specified sizes in three dimensions.

NOTE. This definition is different from that given in ISO 1791.

2.9 component range drawing. *Drawing* showing the sizes, system of reference and performance data of a range of *components* of a given type.

NOTE. This definition is different from that given in ISO 1046.

2.10 contract drawing. *Drawing* that is legally binding upon parties to a contract.

2.11 controlling line. Line on a *drawing* representing a key reference plane.

NOTE. This definition is identical with that given in DD 51.

2.12 co-ordinate axes. Reference lines that are in space and intersect at right angles through the point of origin 0.

NOTE. There are three co-ordinate axes, represented in figure 9 by the lines X, Y and Z.

2.13 co-ordinate plane. Plane defined by two of the three *co-ordinate axes*.

2.14 co-ordinating plane. Plane by reference to which one *component* is co-ordinated with another.

NOTE. This definition is identical with that given in ISO 1791.

2.15 cut. *Section* also showing features beyond the plane on which the cut is taken.

NOTE. This definition is different to that given in ISO 1046.

2.16 cutting plane. Plane on which a *cut* or *section* is prepared.

2.17 datum. Theoretically exact geometric reference to which required characteristics of related features are measured or referred.

2.18 detail drawing. *Drawing* showing parts of the construction or a *component* generally to a large *scale*, with specific information about the form and construction or about the *assembly* and joints.

2.19 diagram. *Drawing*, whether to *scale* or not, giving a simplified representation of functional relationships, *assembly* sequences, etc.

2.20 dimetric projection. *Axonometric projection* in which the projection of the X axis is at 41° 30' above the horizontal, the projection of the Y axis is at 7° above the horizontal, and the projection of the Z axis is vertical. The *scales* on the projected Y and Z axes are the same; a different *scale* is used on the projected X axis (see figure 9).

2.21 drawing. Information presented in a graphical manner, which may include annotation.

2.22 element. Functional part of a structure constructed from materials and/or *components*.

NOTE. This definition is different from that given in ISO 1791.

2.23 elevation. *View* on a vertical plane.

2.24 exploded view. *Drawing* of an *assembly*, usually in *isometric projection* or *perspective*, in which the *components* are drawn to the same *scale* and correctly orientated relative to each other, but are separated from each other in their correct sequence along common axes.

2.25 first angle projection. *Orthographic projection* comprising the arrangement around the principal *view* of an object of some or all of the other five *views* of that object.

NOTE. Each *view* shows what would be seen by looking on the far side of an adjacent *view* (see figure 9).

2.26 general arrangement drawing. *Drawing* showing the layout of construction works, including location, references and sizes.

NOTE. The term 'general location drawing' is deprecated.

2.27 grid. Framework of reference lines (see clause 14).

2.28 interrupted view. *View* or *section* in which there is a break in continuity.

2.29 isometric projection. *Axonometric projection* in which each of the three *co-ordinate axes* is inclined at the same angle to the *projection plane*; therefore, the *scales* on the projections of the axes are the same. The projection of the Z axis is vertical, and the projections of the X and Y axes are at 30° above the horizontal, to the right and left respectively of the Z axis (see figure 9).

2.30 layout drawing. *Drawing* of spaces or rooms providing more information than *location drawings*.

2.31 leader line. Line linking annotation to a feature (see figure 3).

2.32 location drawing. *Drawing* used to locate sites, structures, buildings, *elements*, *assemblies* or *components*.

2.33 modular co-ordination. Dimensional co-ordination employing the basic module of 100 mm or a multi-module.

2.34 oblique projection. *Projection methods* in which the *projectors* are parallel and intersect the *projection plane* at an angle other than 90°.

NOTE. See *planometric*, *cabinet* and *cavalier projections* and also figure 9.

2.35 one-point perspective. *Perspective* with one *vanishing point* in which an object has one of its faces parallel with the *projection plane* (see figure 9).

2.36 orthogonal. Drawn at right angles.

2.37 orthogonal projection. *Projection method* in which the *projectors* are at right angles to the *projection plane*.

NOTE. See *orthographic* and *axonometric projections* and also figure 9.

2.38 orthographic projection. *Orthogonal projection* in which *views* of an object are positioned systematically relative to each other. Adjacent *orthogonal projections* are drawn on planes that are mutually at right angles and, in general, the object is positioned with its main faces parallel with these planes.

NOTE. See *first* and *third angle projections* and figure 9.

2.39 permitted deviation, lower. Algebraic difference between the lower limit of size and the corresponding *reference size*.

2.40 permitted deviation, upper. Algebraic difference between the upper limit of size and the corresponding *reference size*.

2.41 perspective projection. *Projection method* in which one or more groups of *projectors* converge on their respective *vanishing points*.

NOTE. See *one-point*, *two-point* and *three-point perspective* and also figure 9.

2.42 plan. *View*, *section* or *cut* on a horizontal plane.

2.43 plan of work. Logical sequence of activities affecting the planning and execution stages of construction projects and involving all disciplines concerned with the construction process.

2.44 planometric projection. *Oblique projection* in which faces parallel to the horizontal *projection plane* are *true views* and in which the *scales* of the projections of all three *co-ordinate axes* are identical (see figure 9).

2.45 preliminary drawing. Illustration of the designer's concept of a project.

NOTE. The term 'sketch plan' is deprecated.

2.46 production drawing. One of a set of *drawings* for the manufacture of *components* and *assemblies* for, and construction of, projects for the construction industry, usually comprising site drawings, *general arrangement drawings* (*plan*, *sections*, *cuts*, *elevations*), *assembly drawings*, *component range drawings* and *detail drawings*, completely sized and bearing all the information required.

NOTE. The term 'working drawing' is deprecated.

2.47 projection method. Means of depicting a three-dimensional object on a plane (see figure 9).

2.48 projection plane. Plane on which a view of an object is projected.

2.49 projector. Line projected from a feature of an object to aid the drafting of *views*.

NOTE. The term 'projection line' is deprecated.

2.50 record drawing. *Drawing* that records the form, materials and/or condition of a site, construction, *element*, *assembly* or *component*.

2.51 reference size. Size specified in the design to which deviations are related.

2.52 right hexahedron. Solid figure having six rectangular faces.

2.53 running dimensions. Series of dimensions that extend from a *datum* or fixed point and that are set out along a continuous line on which each individual dimension is the distance from the *datum* (see figure 20).

2.54 scale. Linear proportion which the representation of an object bears to the object itself (see table 4).

2.55 schedule. Tabulated information on a range of similar items.

2.56 section. *Drawing* of only those features of a part that are contained on a plane passing through it.

NOTE 1. Contrast with *cut*.

NOTE 2. This definition is different from that given in ISO 1046.

2.57 site plan. *Plan* used to locate position of construction works in relation to setting out points, means of access and general layout of site. It may also contain information on service networks, roadworks and landscape.

NOTE. This definition is different from that given in ISO 1046.

2.58 storey. Space between two consecutive floors or decks, or the space between a floor and a roof.

NOTE. This definition is different from that given in BS 3589.

2.59 structural grid. *Grid* defined in terms of the nodes of the main structural *components*.

2.60 target size. A *reference size* from which deviations are taken to be zero.

2.61 third angle projection. *Orthographic projection* comprising the arrangement around the principal view of an object of some or all of the other five views of the object (see figure 9).

NOTE. Each *view* shows what would be seen by looking on the near side of an adjacent *view*.

2.62 three-point perspective. *Perspective* with three *vanishing points* in which an object has all its faces inclined to the *projection plane* (see figure 9).

2.63 tolerance. Permitted variation of a size.

2.64 triad. Three-dimensional *grid*.

2.65 trimetric projection. *Axonometric projection* in which the projections of the X and Y axes are at different angles above the horizontal and the projection of the Z axis is vertical. A different *scale* is used for each of the three projected axes (see figure 9).

2.66 true view. *View* of only those features of an object that lie on a plane parallel to the *projection plane* (see figure 9).

2.67 two-point perspective. *Perspective* with two *vanishing points*, in which an object has its vertical faces inclined to, and its horizontal faces at right angles to, the *projection plane* (see figure 9).

2.68 vanishing point. Point on the horizon line or other reference line at which parallel lines appear to meet in *perspective*.

2.69 view. *Drawing* of how an observer, situated at infinity and looking in a direction at right angles to the *projection plane*, would see an object.

NOTE 1. This form of representation corresponds to the *orthogonal projection* used in descriptive geometry.

NOTE 2. A view can include hidden outlines.

3 Range of drawings

3.1 General

The selection of drawings needed for a given project depends upon the brief and upon the size, simplicity or complexity of the project and should relate to the particular stage reached in a 'plan of work'.

3.2 Survey drawings

Survey drawings, based upon a measured survey or the relevant Ordnance Survey sheet, can be used for the production of block and site plans. When based upon a measured survey of a site or construction, they can be used for the setting out of preliminary and production drawings.

3.3 Preliminary drawings

Preliminary drawings convey a visual impression of the designer's interpretation of the brief, usually in orthographic projection and accompanied perhaps by a pictorial impression in either axonometric, oblique or perspective projection (see figure 9). They show the feasibility of a scheme upon which an order of cost can be based.

3.4 Production drawings

The production drawings for a project can include location drawings, such as general arrangement drawings, also layout drawings, assembly drawings, and component range drawings and schedules, with additional detail drawings and diagrams as necessary.

Production drawings are often used to accompany applications for statutory approvals, for tendering purposes and as contract drawings.

3.5 Record drawings

Record drawings are often based upon production drawings but incorporate a record of construction as built, and of services as installed. They establish the location of hidden components and services, underground and within construction works, and facilitate the carrying out of maintenance, repair and alteration work.

3.6 Charts, graphs and tables

Information regarding the preparation of charts, graphs and tables is given in BS 5476 and DD 52.

Production of drawings

4 Information

Drawings should be complete for their respective purposes, either by themselves or with regard to the information they impart when read in conjunction with other relevant information.

A drawing conveys information graphically, and annotation on drawings should be kept to the minimum necessary to meet its intended purpose.

Information such as descriptions of materials and quality of workmanship should form part of the specification and should not be duplicated unnecessarily on drawings.

The delineation of outlines will suffice for the portrayal of repetitive features provided that their location and identity are clearly shown, and provided that one of the repetitive features is shown in detail.

Unnecessary proliferation of drawings should be avoided.

5 Function of each drawing and its place in the set

5.1 General

The information required for most construction projects has to be divided between several drawings that together form a project set. It is essential that sets of drawings are arranged in a logical manner. Each drawing should therefore have a clearly defined purpose and an identifiable place (in a set) that will be recognizable to users from the title and number of the drawing. An index of drawings should be compiled for each set.

In cases where a large number of drawings of various types are necessary, some classification of the drawings into groups should be carried out to facilitate the retrieval of information during the construction process and to identify drawings for specific users.

5.2 Titling

Titles should be concise but should identify the contents of each sheet comprehensively. They should reflect drawing subjects occurring at a particular location, for example floor 2, specific elements or components, such as roof, and information presented in a certain form, for example location information.

The terminology used in titling should be consistent throughout a project, particularly with regard to the identification of storeys, rooms, other areas and features (see clause 16).

5.3 Numbering

A drawing number can indicate the location of a drawing in a numerical sequence in order to facilitate filing and

referencing, and can be extended to aid the search for data, by the use of codes, to indicate the type of information contained on a drawing.

Care should be taken to avoid putting too much information in a drawing number.

When more than one drawing occurs on a sheet, a separate identity should be given to each of the drawings.

6 Schedules

Schedules are a convenient and effective means of bringing together related information concerning similar components. They can be used as a basis for the ordering and checking of components.

For the purposes of this standard a schedule that is prepared on a drawing sheet and is numbered as part of a drawing set is deemed to be a drawing.

Schedules have a co-ordinating role in providing important cross-references, particularly between location drawings, assembly and component range drawings.

A standard format has the advantage of providing information in a manner that can be recognized and assimilated easily.

The preparation of schedules can assist the designer in rationalizing the selection of materials, components or details.

7 Referencing of drawings*

7.1 General

A referencing system should lead the user to the required information, in as few steps as possible.

Every reference should include adequate information to identify the drawing, document or document clause to which it refers.

As well as leading the reader from location to assembly and component, a reference system should operate in reverse, so that the location of a component can be found.

7.2 Key diagram

For large projects, a key diagram showing the part of the project covered by the particular drawing sheet should be given. The key diagram, with the appropriate part emphasized, should appear on each relevant drawing.

7.3 North points

A north point should be included on every block, site and general arrangement plan. Geographically related plans should be drawn with the same orientation.

*See also ISO Technical Report 7084, which deals with systems of designations and references for different types of drawings and associated documents, primarily those that are used in the manufacture of components and the construction of building projects.

8 Checking procedures

Drawings should be checked in detail before they are issued, preferably by someone other than the originator(s) of the drawings.

It is useful if a standard checking procedure is adopted to check both technical accuracy and drawing consistency. This is best achieved by marking up a print. A typical check list could include sizes, conformity with other relevant drawings, conformity with regulations, drawing numbers, cross-referencing, scales, revision notes, spelling and the consistent use of terms.

Amended drawings should be checked to ensure that the required amendments have been incorporated correctly.

9 Revision of drawings

A short description of each revision should be provided under consecutive revision letters, within a space adjacent to the title panel. The date of completion of the revision and the name or initials of the person effecting the revision should be stated.

Whenever feasible, some means should be used to identify the location of the most recent revisions, for instance by circling the locations in pencil on the back of the negative of amended sheets.

10 Record of drawings

A record should be kept of the date of the production and revision of original drawings. Further records should be kept regarding the issue and receipt of prints.

Presentation of drawings

11 Drawing sheets

NOTE. See BS 3429, BS 4000, BS 4210, BS 5536 and ISO 5457.

11.1 Selection and designation of sizes

11.1.1 General. Sizes of trimmed sheets for original drawings and reproductions should be selected from tables 1, 2 or 3.

11.1.2 First preference. The first preference for sizes of sheets should be as set out in table 1. The sizes shown are selected from the main ISO-A series.

11.1.3 Second preference; special elongated sizes.

The second preference for sizes, when a sheet of greater length is needed, should be as set out in table 2. The sizes shown are derived from the ISO-A series.

These sizes are obtained by extending the shorter sides of a format of the ISO-A series to lengths that are multiples of the shorter side of the chosen basic size.

11.1.4 Third preference; exceptional elongated sizes.

The third preference for sizes, when a very large or extra long sheet is essential, should be as set out in table 3.

These sizes are obtained by extending the shorter sides of a format of the ISO-A series to lengths that are multiples of the shorter sides of the chosen basic size.

11.1.5 Trimming of sheets; tolerances. Dimensional tolerances for trimmed sizes are given in ISO 216.

11.2 Layout (see figure 1 and ISO 5457)

11.2.1 Borders. Microfilming techniques require the use of borders. Borders enclosed by the edges of a trimmed sheet and the frame limiting the drawing space should be provided with all sizes of drawing sheets.

11.2.2 Filing margin. A margin can be provided to facilitate filing in binders.

11.2.3 Centring marks. At least four centring marks should be provided on all drawing sheets to facilitate positioning of drawings that are to be reproduced or microfilmed.

Sheet sizes selected from table 1 or table 2 should have centring marks placed at the ends of the two axes of symmetry of the trimmed sheets.

Sheet sizes selected from table 3 (except for A4 × 5) that cannot be microfilmed on one frame, should have additional centring marks placed on their long sides at the mid-point of each section to be filmed. The size of the sections should be such that sufficient overlap occurs for ease of drawing reassembly. The drawing number and metric reference graduation (see 11.2.5) should appear on each section.

11.2.4 Orientation mark. A mark, consisting of an arrow pointing towards the draughtsman and coinciding with the relevant centring mark, should be provided on all drawing sheets to indicate the orientation of the drawing, particularly for purposes of reproduction or microfilming.

Table 1. Drawing sheet sizes; first preference

Designation	Size
	mm
A0	841 × 1189
A1	594 × 841
A2	420 × 594
A3	297 × 420
A4	210 × 297

Table 2. Drawing sheet sizes; second preference

Designation	Size
	mm
A3 × 3	420 × 891
A3 × 4	420 × 1189
A4 × 3	297 × 630
A4 × 4	297 × 840

Table 3. Drawing sheet sizes; third preference

Designation	Dimensions
	mm
A0 × 2*	1189 × 1682
A0 × 3	1189 × 2523†
A1 × 3	841 × 1783
A1 × 4	841 × 2378†
A2 × 3	594 × 1261
A2 × 4	594 × 1682
A2 × 5	594 × 2102
A3 × 5	420 × 1486
A3 × 6	420 × 1783
A3 × 7	420 × 2080
A4 × 5	297 × 1051
A4 × 6	297 × 1261
A4 × 7	297 × 1471
A4 × 8	297 × 1682
A4 × 9	297 × 1892

*This size is equal to 2A0 of the ISO-A series.

†For practical reasons, the use of these sizes is not advisable.