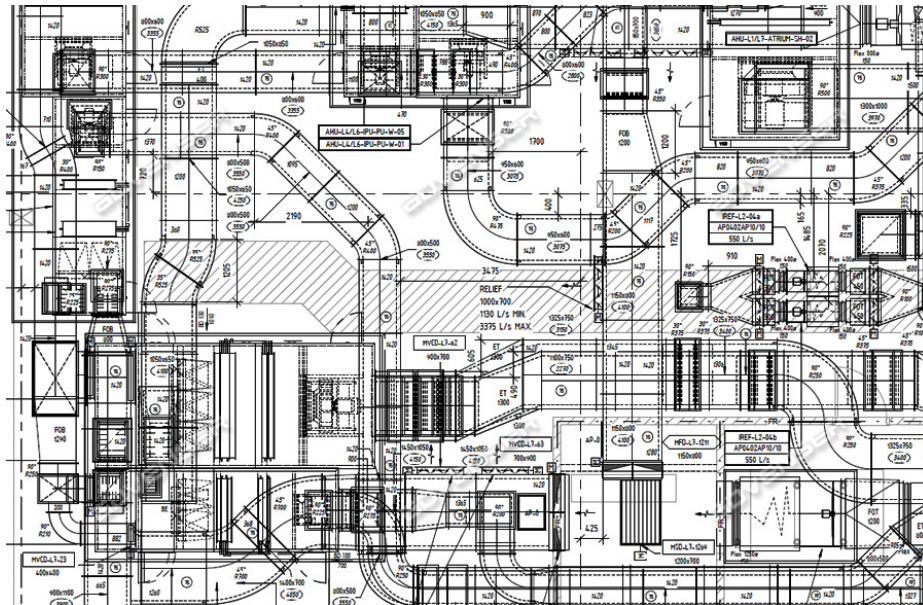




# **Construction Drawings**

## What is a Construction Drawing?

Construction drawing is the general term used for drawings that form part of the production information that is incorporated into tender documentation and then the contract documents for the construction works. This means they have legal significance and form part of the agreement between the employer and the contractor.



## What is the purpose?

The main purpose of construction drawings is to provide a graphic representation of what is to be built. Construction drawings should be concise and coordinated to avoid, wherever possible, ambiguity and confusion. Delays and misunderstandings can be minimised by properly coordinating the drawings.

## How are they different from specifications?

Specifications will detail the materials, standards, techniques, and so on required to carry out the works. Construction drawings provide the graphical representation, indicating the arrangement of components, detailing, dimensions, and so on. They may sometimes contain some of the information set out in specifications.

## What do they contain?

A complete set of construction drawings tends to comprise floor plans, elevations, sections, and detail drawings, that together provide a complete representation of the building. On many projects, each major trade will have separate trade drawings, e.g., electrical, plumbing, Ventilation and so on.

## How are they prepared?

Construction drawings may be prepared by hand, but it is more common for them to be prepared using computer-aided design (CAD) (or computer-aided drafting) software.

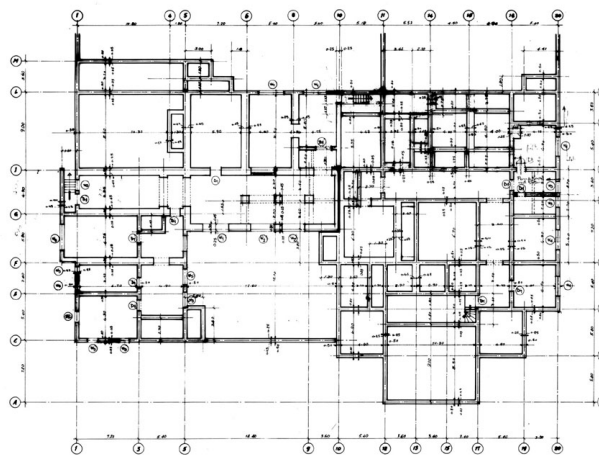
More recently, the use of Building Information Modelling (software) has allowed the creation of a 1:1 virtual construction model (VCM), containing information allowing all objects in the model to be manufactured, installed, or constructed.

## What is an Orthographic Projection?

Orthographic projection is a technique for drawing a three-dimensional object in two dimensions, by 'projecting' its surfaces into a two-dimensional representation, where the projection lines are orthogonal to (perpendicular to) the projection plane (that is, there is no foreshortening or perspective).

## What are Floor Plans?

Floor plans are a form of orthographic projection that can be used to show the layout of rooms within buildings, as seen from above. They may be prepared as part of the design process, or to provide instructions for construction, often associated with other drawings, schedules, and specifications.



## What is included in the Floor Plans?

Floor plans may include key dimensions and levels, and may also use hatching, symbols and other standard annotations and abbreviations to indicate materials, fittings, and appliances, and so on.

## How big are Floor Plans?

Depending on the size of the building, floor plans are typically drawn at scales of between 1:200 and 1:20 and in our industry 1:50. Remember to check the KEY or legend as fire walls are Different line types, colours and weights can be used to differentiate between the types of walls and components and drawn information they include.

## **What are Floor Plans used for?**

Floor plans can be drawn for whole buildings, a single floor of a building, or just a single room. The more detailed the floor plan is in terms of layout, fittings and so on, the more useful and instructive it will be for the project. However, if spaces are complex, it is normal for separate drawings to be prepared for different trades, such as electrical and lighting drawings, plumbing drawings, and so on.

## **What does a Floor Plan look like?**

The floor plan view should be roughly centred on the sheet, with the front of the building typically drawn along the lower side of the sheet. A north point may be included to show the orientation of the floor plan.

Typically, the outside walls are drawn first, to lay the plan out on the sheet, then the internal walls, then windows, doors, stairs, lifts, ramps, and so on, are added. An arrow is used to indicate the upward direction of stairs and ramps. It is usual for a faint dotted line to be drawn around stairs (or other openings) where they are open at ceiling level.

Rooms should be clearly labelled, with block lettering in the centre of each room. The correct symbols should be added for elements such as appliances, fixed furniture, fittings, building services, and so on.

Electrical symbols should be added to the drawing, indicating power socket, light switches, wall and ceiling lights, detectors and alarms, extract fans, and so on.

Items that are ceiling mounted, are generally drawn on the floor below their place of installation. Dimension may be added to indicate the size and location of key elements such as rooms, fittings, appliances or fixtures external walls, window and door openings, and so on.

Section lines may be added where there are section drawings associated with the floor plan. Grid references may also be added to help co-ordinate the floor plan with other drawings.

Some floor plans may include notional furniture to help gauge the likely size of circulation spaces. If a window or door schedule is to be prepared, doors and windows may be labelled with a number or letter, corresponding to an item on the schedule.

Floor plans should not duplicate information that is presented in specifications or schedules because of the potential for conflict. Instead, they should refer to the specification or schedule.

## **What are the BS 8888 drawing standards?**

BS 8888 is the UK's national framework standard for engineering drawings and geometrical tolerancing. It covers all the requirements for the technical specification of products and their component parts. Among other things, it explains the way in which engineering drawings outline and present these specifications.

## **What is a revision?**

The term "Drawing Revision" refers to modifications that are made to a drawing after it has been signed and issued. The first revision to a drawing takes place after the initial issue of the drawing is signed and released for bid or construction.

## **What is the purpose of drawing revisions?**

The revision of drawings is about keeping drawing records up to date to accurately show the details of an existing construction or to define the scope of what is to be installed or modified for a project.

## **UK's national standard for engineering drawings revised**

BSI, the British standards company, has revised BS 8888:2017 –Technical product documentation and specification. The latest version is a comprehensive update to the UK's national framework standard for engineering drawings and geometrical tolerancing.

BS 8888 defines the requirements for the technical specification of products and their component parts. The standard explains the way in which engineering drawings outline and present these specifications and covers all of the symbology and information that engineers and designers need to include on their drawings, whether they are produced in 2D or in 3D, created using CAD systems and 3D modelling.

Acting as a navigational roadmap to the ISO standards, BS 8888 provides information engineers need on a regular basis, including the nuts and bolts of engineering specification. The revised standard aims to help UK industry move over more fully to the ISO system of geometrical product specification and is based on the ISO GPS system of product specification standards. BS 8888 brings together all international standards needed to prepare technical product specifications. The standard aims to assist UK industry to use the 200 or more international standards on documentation, specification, and verification.

The standard has been restructured to make it easier to find key information and to improve the flow of requirements to reflect how they will be used by designers and engineers in practice. BS 8888 ensures that its users have access to one reference source with all the relevant information; enables you to speak the same language when specifying and graphically representing products; provides precision and accuracy, leaving no room for misinterpretation; helps the smooth transfer of the design concept to the manufacturing process; shortens the product development time; increases speed to market.

Dan Palmer, Head of Market Development for Manufacturing and Services, said: “BS 8888 is the descendent of the world’s original engineering drawing standard, BS 308, and the revised standard is aimed at engineers who were trained using BS 308 as well as new users. The benefits of BS 8888 include improved productivity, reduced costs, and enhanced quality. For industry, this can mean fewer disputes over compliance or noncompliance of components, reduced scrap and re-works rates, and fewer queries due to incomplete specifications.”

The updated standard is expected to be particularly useful to mechanical engineers, engineering designers, and design engineers in the UK, working in engineering and manufacturing companies, particularly in defence, aerospace, automotive, rail, nuclear and other general manufacturing sectors. Essentially, any engineering drawing should comply with the requirements of BS 8888. Independent design consultancies or design agencies are also set to benefit from BS 8888.

Leading UK organizations such as Airbus, Sellafield, Jaguar Land Rover, and BAE Systems are all represented on the committee responsible for BS 8888 and represent the typical target markets for the standard.