



great designs deserve great specifications

N10

General fixtures/furnishings/equipment

This guide provides an introduction to writing specifications for general fixtures, furnishings and equipment should be read in conjunction with the guide Introduction to Writing Architectural Specifications. Together these guides provide an in depth reference for the development of specifications based on a simple framework that can be applied to projects of all sizes.

Contents

This guidance note covers the prescriptive specification of general fittings, furniture and equipment. Fittings, furniture and equipment relating to a specific function which are likely to form part of a distinct trade or supply package are best specified within their own Works Section.

The specification of kitchen and sanitary fittings, furniture and equipment should be provided within the following Works Sections.

- N11 Domestic kitchen fittings.
- N13 Sanitary appliances/fittings.

For other types of function specific fittings, furniture and equipment Works Section references N20 onwards can be utilised within the CAWS framework.

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Design Considerations

General fittings, furniture and equipment typically comprise:

- Finished products where the Contractor is required to carry out their installation only, e.g. grab rails.
- Purpose made items where the Contractor is responsible for the manufacturer/assembly and installation, e.g. timber shelving units.

Although general fittings, furniture and equipment specified within this section will normally be located internally they may also be located externally.

The overall performance requirements of individual fittings, furniture and equipment must satisfy the specific requirements of the project. Project requirements include functional and aesthetic criteria as well budget; design life; time and environmental considerations. Once established the key characteristics and associated levels of performance required for fittings, furniture and equipment can be identified.

The selection of products and materials should be undertaken in consultation with suppliers and with reference to relevant British Standards, Statutory Regulations and current best practice.

Timber Fittings

Aesthetic Characteristics

For timber products the importance of aesthetic characteristics will depend upon whether a transparent or an opaque finish is to be applied to them.

Where an opaque finish is specified considerations principally relate to size and shape. The choice of species will be less critical. Where a transparent finish is specified the choice of timber species will be of greater significance. Considerations will include:

- Colour.
- Grain.
- Quality (extent of imperfections such as knots, splits, etc).
- Texture.

Note the appearance of timber may be changed by the application of transparent finishes. Likewise untreated timber may change when exposed to the environment.

Quality

Quality relates to the degree of imperfections present within the timber and encompasses:

- Spiral of grain.
- Degree of slope of grain.
- Size and clustering of knots.
- Presence of resin pockets.
- Presence of splits, ring shakes (tangential separation of the wood fibres along parts of the annual rings) and checks (separation of fibres along the grain).
- Discolouration of sapwood.
- Presence of wane (original underbark surface).
- Presence of exposed pith (soft tissue).
- Degree of decay and insect attack.

The quality required, i.e. the level of defects permissible, will depend on the standard of finish required, whether fittings are external or internal and type of finish to be applied.

Durability

The durability of wood depends upon its ability to withstand various forms of biological attack, primarily fungal (causing dry and wet rot) and insect attack. As natural characteristics of wood vary from species to species so does durability. BS EN 350-2 identifies the durability of common soft and hardwood species to fungal and different forms of insect attack.

For internal timber fittings durability against insect attack will form the principal concern while for external fittings fungal attack is likely to pose the greater risk.

Durability against insect attack is defined within BS EN 350-2 using a two or three class system depending on the species of insect concerned:

- Durable (does not imply total resistance to insect attack).
- Moderately Durable (referenced in relation to termites and marine borers only).
- Susceptible.

Where a wood does not provide the desired level of durability for its end use and location it may be treated with preservative.

Workability

The ease with which timber can be worked varies from species to species. The level of workability required will depend on the scope of works, the extent of on site alterations/fabrication needed and level of craftsmanship required.

Dimensional Movement

Dimensional movement refers to the changes in the dimensions of dried timber that occur when it is subjected to variations in its environment, i.e. temperature and humidity.

The acceptable level of movement will be determined by the quality of finish required and the range of temperatures and humidity anticipated within the timber's environment.

Moisture Content

Variations in moisture content of timber cause the wood to expand and contract, mainly across the grain. As a result timber that has not been dried to the appropriate moisture content (i.e. reflecting the moisture content that it will achieve in its final environment) will be subject to shrinkage, warping and splitting.

The appropriate moisture content will depend on:

- Whether timber is to be located internally or externally.
- Where internal, whether the space will be heated or unheated.
- Where heated, the average temperature range.

British Standards

BS EN 942 sets out the requirements for the grading and classification by Appearance Quality of timber joinery products or individual joinery elements. The Standard is applicable to timber used at the time of product manufacture and the evaluation of the product itself.

The performance classifications for timber trims set out within BS EN 942 are:

Appearance Quality

According to the size and clustering of knots and assessment of seven other types of defect the quality of timber for joinery is classified into different classes ranging from J2 to J60.

Quality is defined by the maximum permissible diameter of knots within the timber in millimetres, prefixed with the letter 'J', i.e. J2 equates to timber with a maximum knot size of 2mm.

BS 1186-3 is sometimes incorrectly referenced when stating the appearance quality classification. BS 1186-3 uses a different appearance quality classification system that relates to the provision of isolated timber trims, e.g. skirting, architraves

and fascia only.

Moisture Content

The recommended moisture levels for different environments set out within BS EN 942 are:

- 12% - 19% External.
- 12% - 16% Internal with intermediate heating.
- 9% - 13% Internal with continuous heating, 12-21°C.
- 6% - 10% Internal with continuous heating, 21+°C.

Note that the recommended moisture levels are more onerous than those stated within BS 1186-3.

BS EN 942 does not provide guidance on the workability and degree of dimensional movement for different timber species. Guidance is however provided within BS 1186-3

Treatment of Timber & Engineered Wood Products

BS EN 335-1 defines five different service situations that wood and wood based products may be exposed to by reference to User Classes, these are:

Class 1 Interior covered (dry).

Class 2 Interior or exterior (occasionally wet).

Class 3.1 Exterior, above ground and protected (occasionally wet).

Class 3.2 Exterior, above ground and unprotected (frequently wet) .

Class 4.2 Exterior, in ground contact and/or fresh water (predominantly or permanently wet).

Class 4.2 Exterior, in ground (severe) and/or fresh water (permanently wet).

Class 5 In salt water (permanently wet).

These User Classes provide a means of reporting the suitability of treated and untreated wood and wood products for different end use environments. It also provides a means for specifying the level of preservative treatment required.

Where a wood does not provide the desired level of durability for its end use and location it may be treated with preservative. The type of treatment, and how it's applied, will depend on several factors:

- Natural durability of the species of timber.
- Required level of durability after treatment.
- Treatability of the timber (its resistance to penetration by preservatives, also referred to as its permeability).

- The ease of any future maintenance, i.e. the re-application of preservatives.
- Location and use (some preservative treatments are not suitable for agricultural or internal uses).

The type of preservative used and the method of application will vary depending upon the type of wood, source and end use requirements.

The most effective means of applying preservative treatment is by industrial pre-treatment. Pre-treatment methods have the advantage that preservatives can be applied in a measured and controlled manner suitable for the species of wood, its end use and desired service life. Methods of pre-treatment are:

- Vacuum, high pressure treatments - Use Classes 1 to 4.
- Double vacuum, low pressure treatments - Use Classes 1, 2 and 3.1.

There are a large range of preservatives that can be used to treat timber. These may be broadly defined as either being copper based or non metallic.

Copper based preservatives may corrode certain metal products (including fasteners, hardware and flashing). To prevent premature corrosion and failure it is important to follow the recommendations of the manufacturer for all metal products.

Some non metallic treatments, do not become fixed in the wood and can readily leach out overtime. The need to re-apply preservative at regular intervals should be taken into consideration.

Timber Certification

The UK Government's timber procurement policy requires that all timber and wood-derived products must be independently verifiable and either from a:

- Legal and Sustainable source; or
- FLEGT-licensed or equivalent source;

The policy is mandatory for all Central Government Departments, Executive Agencies and Non Departmental Public Bodies. Local Authorities, and other public bodies.

The policy provides a recognised benchmark and its adoption within the private sector is encouraged by the Government and may be considered as general good practice when specifying timber based products.

Compliance with the UK Government timber procurement policy is achieved by ensuring that Contracts contain a suitably worded condition. Usually this will take the form of an appropriately worded clause within the Specification or Contract Preliminaries.

In order to assist compliance with the policy the government has identified two types of evidence that can be used to demonstrate the legality and sustainability of timber and timber products:

- Category A : Certification of materials under one of the approved schemes
- Category B: All other forms of evidence, for example audit statements, government documentation or supplier declarations.

The use of certified materials provides the most common and simplest form of ensuring compliance. Four certification schemes have been confirmed by The UK Government's Central Point of Expertise on Timber (CPET) as demonstrating that timber and wood products come from legal and sustainable sources. These are:

- FSC (COC): Forest Stewardship Council Chain of Custody
- PEFC: Programme for the Endorsement of Forest Certification Schemes
- CSA: Canadian Standards Association
- SFI: North American Sustainable Forest Initiative

The PEFC is an "umbrella scheme" which endorses national schemes, including the Canadian scheme (CSA) and the North American (SFI) schemes. It is the UK Government's policy to treat all four schemes as equivalent when purchasing timber and wood products.

Substrates

Where fittings are to be fixed to the building fabric the substrate must be sufficiently robust to accommodate any associated loads that will be imposed. This applies to both the applied finish and the substrate itself. Consideration also needs to be given to the method of fixing, e.g. anchor bolts, screw fixings or adhesive fixed.

Where substrates and applied finishes do not provide the requisite level of performance the incorporation of additional support/protection, alternative finishes and, or, substrate local to fixing points may be required.

The requirement for, provision and location of any additional support (e.g. necessary noggin and, or, sheathing) should be identified within the specification.

Where the final extent and setting out of additional support is to be determined by the Contractor this must be clearly indicated within either the Contract Preliminaries or the Scope of the relevant specification section. Equally responsibility for the coordination of all associated trades must be clearly allocated.

Bi-metallic Corrosion

Bi-metallic corrosion is the accelerated corrosion of one metal where it is in contact with another more noble (less corroding) metal.

For bi-metallic corrosion to occur an electrolyte must be present. As a result it tends to arise where:

- Water or condensation does not run off.
- Metals are immersed in water.
- Metals are in contact with the soil.

The rate of corrosion will depend on the:

- Distance apart the differing metals are to each other in anodic index/galvanic series.
- Conductivity of the electrolyte.
- Area of corroding metal in comparison with the metal it is in contact with.

Bi-metallic corrosion is likely to be more serious within coastal environments and where the corroding metal is small compare to the metal it is in contact with.

The extent to which corrosion occurs and the selection of appropriate counter-measures should be considered at the design stage. Measures include:

- Selection of metals close to each other in the anodic index/galvanic series.
- Isolation of dissimilar metals using insulators, e.g. rubber isolating patches.
- Isolation of metals from the environment, e.g. painting, coating.

Specification Guidance

Form of Specification

The specification of general fittings, furniture and equipment will typically be prescriptive in nature, even where the Contractor is responsible for the design of the works under the Contract terms.

This is because there is usually a desire to tightly control the appearance and performance of fittings, furniture and equipment selected. To achieve this using a performance based specification requires the specification of very detailed performance criteria. Compliance with the performance specification would then be dependent upon selecting a product that met these detailed requirements. As a result little opportunity for innovation in the selection of materials or construction methods exists. The advantages of Contractor involvement in the design process would hence be limited, negating the advantages offered by a performance based approach.

This guidance note covers the development of prescriptive specifications for general fittings, furniture and equipment only.

Scope

The Scope provides a brief description of the works specified within the particular section and details any contractual matters that are relevant to them. Care should be taken to avoid repeating particulars already included within the Contract Preliminaries.

Scope of Specification

To help the reader quickly understand which elements of the works are covered in each Works Section it is useful to provide a brief description of items, e.g. *fitted shelving to storage cupboards*.

Form of Specification

State whether the specification is performance based or prescriptive together with any specifically related contractual requirements or information that relate to the Works Section. Do not include any requirements or information already set out within the Contract Preliminaries.

Where the specification is prescriptive in nature requirements placed on the Contractor may comprise:

- The selection, supply and incorporation into the works of all listed accessories and sundry items in conjunction with Manufacturer's recommendations.
- The selection, supply and use of all minor items required for the installation of specified materials and products.
- The coordination of supports and fixings with the installation of architectural, mechanical and electrical systems.
- Preparation and provision of Fabrication Drawings illustrating the final detailing of certain items illustrated or described within the Contract Documents.

It is normal for the terms of a contract or the Contract Preliminaries to state that the Contractor may offer equivalent and, or, substitute products. Where this is not applicable to all Works Sections an appropriate statement must be provided.

Execution of the Works

Any general requirements or information specifically relating to the incorporation of fittings, furniture and equipment which are not contained within the Contract Preliminaries should be listed. These may comprise:

Reference Documents

A list of all instructions, guidance and standards concerning handling, storage, installation and maintenance of materials that the Contractor is to comply with while executing the works must be given. This may include:

- Installation instructions and recommendations provided by the manufacturer(s) of fittings, furniture and equipment .
- British Standards, e.g. *BS 8000-5:1990 Code of practice for carpentry, joinery and general fixings*.
- Workmanship clauses provided within the Specification.

In some circumstances conflicts might exist between the requirements set out within the documents listed. A statement should be included that sets out which documents take precedence or confirms whether compliance with the most or least onerous condition is required.

Dimensions

Construction tolerances and the imperfect nature of existing works mean that dimensions provided within the Contract Documents may not reflect final built dimensions. It is therefore advisable to require that the Contractor confirms actual site dimensions before ordering and cutting timbers.

Product

Within prescriptive specifications the Contractor needs sufficient information to:

- Gain a clear and full understanding of the required works.
- Price the works.
- Order all materials, products and systems required in the execution of the works.

The level and type of product information provided will vary depending on the scope of the project, the type of contract and the nature of the works.

The different types of fittings, furniture and equipment that might be specified within this Works Section can be grouped by type of product and function, *e.g. Free standing shelf units.*

General Items

- Manufacturer: Name of manufacturer, website and telephone number.
- Reference: Product/system reference name and, or, code.
- Finish: Specify finish.
- Colour: Specify colour.

Purpose Made Joinery

- Species: State common and botanical names (inclusion of botanical name helps to avoid confusion between timbers that have similar common names).
- Quality Class: State class of timber required referencing British Standard, *e.g. J2 to BS EN 942*
- Finish: Specify finish, where applicable giving relevant specification reference, *e.g. M60.3360 Satin Paint.*

For MDF products the Quality Class need not be specified. The required Formaldehyde Class should be stated though.

- Formaldehyde Class: *e.g. For all internal trims/joinery MDF must be Formaldehyde Free.*

Accessories/Related Components

Where related components are required and provided by the same manufacturer it is recommended these items are specified as an additional item within the relevant product clause. These can be specified in two ways:

- *Accessories: Cabinet Hinges, reference N10.4100.*
- *Accessories: Cabinet Hinges, manufacturer reference XXXX.*

The last option may be suitable where the final selection of the product to be used can be undertaken by the manufacturer of the principle material, product or system.

Additional Information

Additional descriptive or performance related information can be provided where it is felt that this will aid the Contractor in understanding the scope of works, how they are to be achieved and the required level of workmanship. Examples may include:

- Preservative Treatment: Information provided can include the following criteria:
 - i. Design Life: *e.g. 60 years*
 - ii. Treatment Reference: *e.g. name of proprietary treatment.*
 - iii. Required Durability Classification (BS EN 335-1) of timber post treatment.
- Location: Where a number of similar items are required in some circumstances it may be advantageous to indicate the location of specified items.
- Method of Fixing: Specify the method of fixing where no manufacturer's instructions are provided, i.e. for site made timber fittings.

Where additional information is provided it should be grouped together with the relevant item or clause.

Accessories

Where related components are specified in detail all information needed by the Contractor to order the correct materials or products must be given.

Check with the manufacturer of the principal materials, and products that the selected components are compatible with other systems. Information to be provided may comprise:

- Manufacturer: Name of manufacturer, website and telephone number.
- Reference: Product/system reference name and, or, code.
- Finish: Specify finish.
- Colour: Specify colour.

Workmanship

Additional requirements relating to the installation of specified materials and products can be provided within Workmanship Clauses. Requirements relate to:

- Scope of works, e.g. frequency of movement joints.
- Additional design information, e.g. setting out information, joint widths, etc.
- Quality control, e.g. permissible tolerances, discarding non-compliant materials.
- Method of working, e.g. sequencing or works.

In the majority of instances guidance provided by BS 8000 Part 5 and product manufacturers will be sufficient to enable the Contractor to undertake the work to a high standard. Additional requirements may be provided that expand upon, alter, confirm or emphasise requirements already outlined within the reference documents (i.e. where work needs to be undertaken to an historic building in a particular manner).

Where workmanship clauses stipulate the method of working to be employed by the Contractor, check that any instructions given will not reduce the performance of the material in question.

Storage of Timber Products

Where timber products are stored on site they must be stored within a stable environment, at a temperature and level of humidity that maintains the moisture content of the timber fittings within the required range. This ensures timber has the correct moisture content at the time of fitting. It also helps to reduce the risk of timber fittings warping, splitting, shrinking or weakening due to fluctuations in moisture content.

Where applicable instruct the Contractor to adhere to product manufacturer's storage requirements or recommendations.

Moisture Content

To reduce the risk of joinery products warping, splitting, shrinking or weakening due to fluctuations in their moisture content once installed, wood fittings should be:

- Left to stand in their end use environment for a period of time prior to installation to ensure its stability.
- Installed only once the building is sealed and provides a dry environment reflective of the final conditions.
- Installed after the completion and drying out of adjacent wet trades.

Advise the Contractor that any fittings that become warped, split, shrunk or weakened are to be discarded and not utilised.

Treatment of Cut Surfaces

Where pre-treated or primed joinery items are used any surface exposed by drilling or cutting should be coated with a cut end preservative. Failure to coat will affect the value of the preservative.

Where the type of preservative treatment is not specified, instruct the Contractor to check that preservative treatments used are suitable for the pre-treated timber.

Setting Out

State any specific setting out requirements, not otherwise indicated within the Contract Drawings, over and above those provided by the product manufacturer.

Instruct the Contractor to notify the Contract Administrator where any conflict exists and seek confirmation of setting out requirements.

Preparation of Substrates

Except where the Contractor is responsible under the terms of the Contract, the requirement for the provision and location of any additional support (e.g. noggins, sheathing, etc) must be identified.

Set out any specific workmanship requirements. Examples might include:

- Provision of noggins and, or, sheathing necessary to provide a robust and secure substrate suitable for the fixing of fixtures and fittings for the length of useable life.
- Coordination of final fixing locations with the all associated trades and services.

Installation

Instruct the Contractor to install all fittings, furniture and equipment in accordance with the product manufacturer's recommendations ensuring that they are:

- Installed plumb and level.
- Where designed to do so, they drain freely as intended.
- Free from damage and protective packaging is retained for as long as practical.
- Where appropriate, in working order and fully operable.

Corrosion Protection

Where dissimilar metals will come into contact the risk of bi-metallic corrosion is likely to occur and the selection of appropriate counter-measures should be considered at the design stage.

Confirm any counter measures that are to be taken and, where applicable, instruct the Contractor to:

- Identify the appropriate primer, protective tape or isolating product (e.g. washer, or sleeve).
- Apply the recommended primer/tape in accordance with the product manufacturer's instructions.

Finishing of Joinery

Where joinery items are to be fabricated and, or, installed by the Contractor set out the quality finish and workmanship required. Instructions should ensure that fittings are in a condition suitable for the application of any specified finishes. Requirements might include, but not be limited to:

- Gaps between trims and adjacent surfaces to be filled with white paintable sealant, applied in accordance with the manufacturer's instructions to provide a continuous even run with a uniform profile.
- Surfaces to be rubbed down to provide a smooth and even surface suitable for specified finishes.
- Sharp edges to be rounded 1-2mm.
- All dust and debris to be removed.

Samples, Tests, Certificates, etc

The following guidance should be read in conjunction with the guidance provided for Samples, Tests, Certificates, etc within Specright's Introduction to writing Architectural Specifications.

Samples

Where the specification is prescriptive in nature it is generally recommended samples are reviewed prior to writing the specification.

Product samples may be requested where the specification is prescriptive in nature and the aesthetic quality of any proposed materials or products need to be checked, e.g. to agree the quality of finish and colour.

Electrical Moisture Test

The requirement for testing will depend upon the nature and sequencing of the works together with methods of working employed by the Contractor.

The electrical resistance method is suitable for measuring timber with a moisture content of 7% - 30%, although over 20% measurements are generally considered to be unreliable. The method of testing varies depending upon the model of meter used. It is therefore important that the instructions provided by the meter manufacturer are followed to ensure that:

- Adjustment is made to take account of the wood species and wood temperature.
- Electrodes are sufficiently long enough to penetrate into the timber by the recommended depth.
- Calibrate measurements according to type/size of tip used to take readings.
- Adjustment is made for the effect that preservatives may have on readings.

Set out the requirements for testing, including:

- Timing of Tests: *e.g. at time of delivery, or, immediately before installation.*
- Test Frequency: *e.g. each batch.*
- Test Method: *Electrical resistance method to BS EN 13183-2 or in strict accordance with meter manufacturer's instructions.*
- Test Results: *State item/batch tested, date and moisture content.*
- Reporting: *e.g. Retain on site for inspection, or, submit to Employers Agent.*

Note that although BS EN 13183-2 may be referenced the current version of the Standard is limited in scope and instructions provided by the meter manufacturer are likely to be more thorough.

Additionally where testing is to be carried out to high quality joinery items it is recommended that the Contractor is advised that probes must be inserted into those timber faces that will be concealed in the final works.

Timber Certification

Where all timber and wood-derived products must be provided from independently verifiable legal and sustainable, or equivalent, sources this requirement together with the permitted method for demonstrating compliance needs to be given. Requirements should include:

- Scope: range of materials/products to be from a certified sustainable source, *e.g. each batch of timber and wood derived products utilised during the course of the works.*
- Acceptable forms of evidence: i.e. list of approved certification schemes.
- Reporting: *e.g. Retain certificates on site for inspection, or, submit to Employers Agent.*

Spares & Tools

Spares or tools that the Contractor is required to provide the Employer with at Practical Completion should be listed including any appropriate instructions:

- List of items, including quantities.
- When spares and tools are to be provided, i.e. at Practical Completion.
- Where items are to be placed or delivered.

Instructions & Training

The provision of instruction manuals as part of the Operating and Maintenance Manual and training of the Employer's staff should be covered within the Contract Preliminaries. Additional items can be specified within the relevant specification section. Details might comprise:

- Documents and training required.
- Where items are to be placed or delivered.
- Who is to provide the training, i.e. Contractor, installer or manufacturer.
- Where training and when training is to be provided.

Standards & References

Joinery Timber

BS 1186-3:1990 Timber for and workmanship in joinery. Specification for wood trim and its fixing (AMD 9386) Requirements for the species, moisture content, classification, quality and workmanship of fixings.

Durability

BS EN 350-2:1994 Durability of wood and wood-based products, natural durability of solid wood

BS EN 355-1:2006 Durability of wood and wood-based products, definitions of use classes

Bi-metallic Corrosion

PD 6484:1979 Commentary on corrosion at bimetallic contacts and its alleviation

Electrical Moisture Test

BS EN 13183-2:2002 Moisture content of a piece of sawn timber. Estimation by electrical resistance method

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