great designs deserve great specifications

Introduction to writing Architectural Specifications

This guide provides an introduction to writing architectural specifications. Further guidance for the specification of specific types of work is provided within the accompanying series of Specification Works Section Guides. Combined they provide an in depth reference guide for the development of Architectural Specifications for the UK Construction Industry.

Specification Framework

Specifications typically comprise preliminaries or general sections followed by a series of trade/work sections that describe the scope of works required for each type of trade or product type.

Specification sections are normally structured in accordance with a standard classification system. The main classification system used within UK for Architectural Specifications is the Common Arrangement of Work Sections (CAWS), developed by the Construction Project Information Committee. The CAWS comprises a classification framework of Groups and Sub-groups. Each Group defines a different building element with Sub-groups, referred to as Works Sections, describing an associated trade.

Works Sections can be further sub-divided. This and accompanying Specright Specification Guides divides the contents of each Works Section into six types of clause.

1. **Scope**: Describes the form of specification used, the works that it covers and any general requirements and information that are specific to the individual Works Section.
2. **Performance**: For performance based specifications this section details the performance criteria that are to be satisfied.
3. **Products**: For prescriptive specifications, Product clauses detail the materials, products and systems that are to be utilised
4. **Accessories**: For prescriptive specifications, Accessory clauses detail accessories and sundry items that are to be incorporated into the works.
5. **Workmanship**: Describes the quality of workmanship that the finished works are to satify.
6. **Samples, Tests & Certificates**: List the samples, tests and certificates, tools spares and manuals that are to be provided or undertaken as part of the Contract.

Each type of clause may not be relevant to every Works Section. It is however recommended that the grouping and order of clause types are kept consistent across the whole specification document to aid referencing and usability.

Clauses

Each clause sets out a specific requirement, or set of requirements in relation to a particular role, element or activity and can be contractual or technical in nature. Clauses that concern contractual matters must not include technical text, and visa-versa. In general it is recommended that clauses relating to contractual matters are placed within the first or last type of clause (Scope or Samples, Tests & Certificates).

As far as it is practical, it is advisable to utilise a standard arrangement of clauses with the numbering and naming of clauses consistent across all Works Sections and different project Specification Documents. This aids familiarity, navigation and the readability.

Clause Content

So the intended audience is able to clearly understand the Specifier's requirements the Specification Document should use simple language, be easy to read, concise and clear both in its structure and wording. The following are therefore best avoided:

- Redundant, contradictory and repetitive content.
- Simplistic statements, generalisations and ambiguous statements that do not identify the required purpose or action, e.g. to industry best practice.
- The use of abbreviations, except where they are commonly understood.
- Repetition of information included in other Contract Documents.
- The use of words or phrases that are subjective or open to interpretation unless specifically intended, e.g. sufficient, adequate or good.
- Repetition of the same Contractor instructions in every section when they could be provided within the Contract Preliminaries.
- Phrases such as 'Contractor's Choice' or 'Subject to approval' should not be used.

As far as practical use consistent language and phrases, especially within clauses of the same title and reference. The meaning of words should also be checked to ensure they correspond with those used by manufacturers and referenced standards or documents.

Form of Specification

Specification sections can be performance based or prescriptive in nature. The type of specification that can be used is determined by the form of Contract being utilised and whether this requires/allows the Contractor to undertake the design of part or all of the works.

Performance Specifications

In a Performance Specification the Designer is responsible for establishing the performance requirements that the completed works are to achieve. The Contractor is responsible for undertaking the design of the works, selecting materials, products or systems to meet the required performance criteria.

The advantage of Performance Specifications is that they allow the knowledge and skills of the Contactor and, or, Manufacturer to be utilised. Resultant innovation can help in the reduction of risk and cost, improve quality and reduce construction times.

The benefits offered by a Performance Specification may however be negated by overly detailed performance criteria that limit the Contractor's choice to a single product, system or design solution thereby restricting innovation. Typically this occurs where the Designer wishes to tightly control the aesthetics of the final design.

In these circumstances the Contractor's scope for innovation is limited to the identification of alternative products and supply chain efficiencies. Both these can be achieved within a prescriptive specification by allowing the Contractor to substitute or propose alternatives. Therefore where the Designer wishes to tightly control the design of the works it may be more appropriate to use a prescriptive form of specification for the relevant Works Section.

Prescriptive Specification

In a prescriptive specification the Designer is responsible for identifying the products to be used by the Contractor in the construction of the works. The performance requirements and the design, products and workmanship required to meet them have been determined by the Designer. The Contractor is not responsible for designing the works.

Subject to the conditions of the Contract, responsibility may however be placed on the Contractor for:

- The selection of minor items associated with the installation of the specified materials, products and systems.
- The selection and provision of accessories and sundry items identified within the specification, where the manufacturer of the principal product, material or system provides the detailed specification for these items.
- Completing the arrangement of components from the specified product type or range, i.e. the arrangement of rainwater pipe and guttering components, in accordance with any requirements stipulated within the specification.

Responsibilities must be clearly stated either in the Contract Preliminaries or within the scope of each Works Section.

The design and provision of temporary works necessary to undertake the works, i.e. scaffolding, shoring and hoarding, are typically the responsibility of the Contractor. This should be stated in the Contract Preliminaries.

Where the substitution of specified materials, products and systems or use of alternatives is permitted this is likely to subject to the approval of the Employer, or their Agent. Detail of the process to be followed and approvals to be obtained prior the use of substitute or alternative products should be set out within the Contract Preliminaries or the relevant Works Section.

Specification Guidance

Scope

The Scope provides a brief description of the works specified within each Works 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 section provide a brief description of items. This may take the form of a simple list of items together with a description of where they are to be incorporated into the works.

Form of Specification

It should be stated whether the Works Section is performance based or prescriptive in nature together with any specifically related contractual requirements or information. This ensures that all parties are aware of their responsibilities. This is particularly important where the Specification Document comprises a mixture of both performance based and prescriptive Works Sections and the Contractor's responsibilities vary between them. Examples of contractual requirements or information that may be set out include:

Performance Specification

- Responsibility for determining the design, selecting appropriate materials, products and systems and constructing the works to meet these requirements.
- Responsibility for demonstrating compliance with the requirements of a performance specification (the means by which compliance will be measured and what information, tests, warrantees, etc, are required).
- Requirement for the submission of preliminary designs, method statements, samples, etc, as part of the Contractor's Tender Submission (generally detailed requirements will be specified separately within the appropriate Prescriptive specification clauses).
- Responsibility for the design and coordination of interfaces between performance based and prescriptive specified items. This is particularly important where the Contractor is required to complete the design of only part of the works.
- Where products or systems are named within a prescriptive specification the purpose for which products are specified, i.e. to establish aesthetic or function performance only.

Prescriptive Specification

- Responsibility for the selection and provision of accessories and sundry items in conjunction with Manufacturers.
- Responsibility for the selection and provision of all minor items as recommended by manufacturers for the installation of specified systems, products and systems.
- The ability of the Contactor to offer equivalent and, or, substitute products (where not set out in the Contract Preliminaries).
- Requirement for the preparation and submittal of fabrication drawings prior to manufacture so that the Contract Administrator can ensure the prescribed design has been correctly interpreted.

The above items need only be included within the Scope of a Works Section where they are not set out within the Contract Preliminaries.

Competence

Where manufacturer's recommend or, where work is to be under warrantee, a statement should be included stipulating that materials, products or systems are installed by trained and certified operatives.

Execution of the Works

In general Contract Preliminaries set out how the works are to be executed by the Contractor and the quality of workmanship expected. Their requirements are likely to vary form section to section and must be clearly identified within the appropriate Works Section.

Generally this will include the identification of standards, guidance and instructions that the Contractor is to comply with in their execution of the works, including the order in which these are to be applied. Responsibility for ensuring the quality and suitability of the works at each stage of construction must also be emphasised (e.g. the requirements to check the suitability of substrates and confirm dimensions by taking site measurements before placing orders).

Reference Documents

The instructions, guidance and standards the Contractor is to comply with should be listed. Examples include:

- Instructions provided by manufacturers detailing how materials, products and system are to be handled, stored, installed and maintained.
- British Standards (e.g. BS 8000 Parts 1 to 16) providing codes of practice setting out how the works are to be designed and executed.

- Workmanship clauses provided within the specification detailing the quality of workmanship required.

In some circumstances conflicts between the requirements set out with the referenced documents may occur. A statement setting out which document takes precedence should be included. Alternatively the Contractor may be instructed to comply with the most or least onerous condition.

Dimensions

Construction tolerances and the imperfect nature of existing works mean that dimensions provided within the Contract Documents may not reflect final built dimensions. To ensure subsequent works fit (e.g. windows to existing openings.) a statement requiring that the Contractor to confirm actual site dimensions before placing orders or commencing the fabrication of certain elements should be included.

Substrates

The suitability of the substrate is critical to the final performance of some materials, products and systems. The product manufacturer and, or, relevant British Standards will normally state the criteria the substrate needs to meet prior to installation.

The Contractor should be advised that it is their responsibility to confirm the suitability of substrates and where necessary to undertake all actions required to guarantee their suitability, e.g. remedial works, drying out, cleaning, priming, etc.

Performance

In performance specifications the Designer is responsible for specifying all performance and design criteria that the works are to satisfy, not the Contractor. These can be set out in three parts.

1. Attribute: the characteristic of the item specified, i.e. slip resistance.
2. Requirements: desired out come in qualitative terms, e.g. low risk of slipping for barefoot traffic when wet.
3. Criteria: measurable property/quality to be achieved in either quantitative or qualitative terms, *e.g. SRV 35+.*

The requirements and criteria given must be capable of being substantiated so that compliance with the specification can be demonstrated by the Contractor.

The requirement for tests and submittals to demonstrate compliance with performance criteria (pre or post tender) should be identified within the appropriate part of the specification, i.e. within Samples, Tests & Certificate clauses.

This ensures that contractual and technical requirements and information are not mixed together, aiding clarity and readability. The Submittal process and the witnessing of testing will usually be included within the Contract Preliminaries, together with a statement concerning the approval process and the scope of any approvals.

The work covered by each Works Section may be treated as a single element with a common set of general performance criteria. Where a Works Section covers a number of distinct items (e.g. the specification of telephone, data and media under W90 for domestic scale projects) each may need to be considered separately with their own separate performance criteria. The structure of performance criteria for each Works Section is therefore likely to vary between sections and projects. It is however recommended that a consistent approach to the structure of each section, performance criteria utilised and methods of demonstrating compliance is maintained as far as possible.

In some instances there may be a need for the system to incorporate specific elements or products. Normally this approach is used where it is difficult to establish objective criteria that can be adequately tested (e.g. where a product reference is used to describe desired aesthetics) or where the Designer requires a specific product to be used as part of the overall works (e.g. the use of solar panels as a heat source). The level of detail provided will depend on the degree of relevance. Where products or systems are named within a performance specification the reason for naming them should be set out e.g. to provide a benchmark for aesthetic or functional performance only.

Products

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

Essential Information

Essential information needed includes details of the primary components, together with any associated accessories and sundry items that need to be provided in order to achieve the level of performance required.

Principal material, product or system information

The appropriate level of detail will vary depending on how items are categorised and referenced by the manufacturer/supplier. At its simplest only the manufacturers' name and product reference may be required. A more typical list will comprise:

- Manufacturer.
- Product Reference.
- Colour/finish reference.
- Product size, if alternatives exist.
- Quantity, where not indicated on drawings.
- Centres, i.e. distance between elements.

For most major manufacturers and suppliers a contact web address and telephone number need only be given. For smaller companies that the Contractor might be unfamiliar with or have difficulty finding full contact details should be given.

Performance Information – Product Substitution

In some instances manufacturers will use different standards to assess/describe the performance of their products. Where standards are not sufficiently aligned it may be difficult to accurately compare products and ensure the required level of performance is provided by any proposed alternative material or product.

Where this occurs the required performance criteria along with reference to the related standard should be stated in order to avoid confusion and the potential for dispute, e.g. Slip Resistance Value (SRV) for floor tiling to BS EN 13036-4.

Accessories and Sundry Items

Sundry items may also be required in conjunction with the principal materials, products and systems to achieve the required performance criteria or enable their installation (i.e. primers, membranes, insulation, finishes, etc).

Accessories and Sundry Items may be specified in three ways:

- Within a separate Works Section, e.g. *Insulation: P20.3100 Sundry insulation/proofing work/fire stops.*
- Within a separate clause, but within the same Work Section, e.g. *Waste: N10.3120.*
- As a named item within the same clause as the main product/system, e.g. *Waste: Stainless Steel Waste.*

In the case of the first two options the accessory/sundry item should be named and the appropriate reference provided.

The last option may be suitable where the final selection of the product to be used can be done by the manufacturer of the principle material, product or system. The Specifier should satisfy themselves that the Manufacturer has sufficient information to select and, or, provide the Contractor with the appropriate items based on the information given within the Contract Documents. The Contractor should not be required to undertaken any design and or select materials or products.

Supporting Information

Additional supporting information may be given in order to aid the Contractor in tendering for and, or, carrying out the works. It is up to the Specifier to decide the value of including this information given the scope of the project, the type of contract and the nature of the works. All supporting information must be provided and grouped together with the item to which they refer.

Supporting information can either describe the physical characteristics of the item in more detail and, or, its performance characteristics.

Physical Characteristics

This is information that will generally aid the Contractor in establishing how the works need to be undertaken, with particular reference to information that may impact on the Health and Safety of operatives such as the handling and cutting of materials. Examples include:

- Size
- Weight
- Thickness

Performance Characteristics

Additional information detailing the performance criteria of materials, products or systems will typically inform the Contractor of the overall level of performance and the quality of workmanship that is to be achieved. Examples include:

- Thermal properties and the prevention of cold bridges
- Acoustic properties and the sealing interfaces
- Fire ratings and fire stopping and sealing of interfaces

This information may provide the Contractor with a greater understanding of the quality of workmanship required and also aid obtaining any Statutory Consents that may be required.

Minor Items

In most instances the designer/specifier will not have access to product manufacturer's installation instructions. Minor items required to undertake installation will be specified and, or, supplied by the manufacturer.

As a result these minor items cannot and need not be identified in detail within the specification. It is also reasonable to assume that the Contractor will make provision for the supply and use of these items.

A clause must be included either within the Contract Preliminaries or the Works Section Scope detailing the Contractor's responsibility regarding the selection, provision and use of all minor items associated within the installation of specified materials, products and systems. Where accessories and sundry items are specified in detail within the Works Section the Contractor must be provided with all information necessary to allow the correct materials or products to be ordered. The Specifier should also check with the manufacturers of the principal materials, products and systems that proposed accessories and sundry items are compatible.

Accessories

Where accessories and sundry items are specified in detail within the Works Section the Contractor must be provided with all information necessary to allow the correct materials or products to be ordered. The Specifier should also check with the manufacturers of the principal materials, products and systems that proposed accessories and sundry items are compatible.

Accessories should be specified in the same manner as the principal materials, products and systems. The level of information provided may however be limited to essential information.

Workmanship

Workmanship clauses provide the opportunity to add additional requirements concerning the execution of the works and the quality of workmanship.

Instructions on how items are to be handled, stored, installed and maintained are normally provided by the Manufacturer. Further guidance may also be contained within current British Standards. In the majority of instances these will be sufficient to enable the Contractor to carry out the work to a high standard. As a result it should not be necessary to describe within the Specification how the works are to be undertaken and materials or products, handled, stored and installed.

Ordinarily Workmanship clauses need only describe the required nature of the completed works and not seek to instruct how the works are to be carried out. Where the Specifier wishes to emphasis existing guidance and, or, provide specific instructions on how the works are to be undertaken (e.g. where work needs to an historic building needs to be executed in a particular manner) then the Specifier should check with the relevant manufacturer that any instructions will not reduce the performance of the material, product or system in question.

Topics covered within Workmanship clauses are wide and varied. Topics are however frequently applicable to more than one Works Section. Therefore in order to facilitate referencing within and between different work section specifications it is recommended that a consistent referencing system is utilised.

One system that can be used is the grouping of workmanship clauses into two categories, the first category relating to the type of activity involved and the second category describing the type of element that the activity relates to.

Activity

1. General: activities that are applicable through out the execution of the works, e.g. health and safety issues, moisture content of timber, etc.
2. Pre-construction activities: delivery/storage/handling: e.g. checking for defective products.
3. Preparative works: temporary works/protection/cleanliness that need to be undertaken before the specified works are undertaken, e.g. the suitability of substrates.
4. Setting out: method of setting out the works to be undertaken.
5. Tolerance: tolerances and allowances that need to be made during setting out and installation/erection.
6. Cutting: methods of cutting materials.
7. Fixing/laying: installation of materials, products and systems.
8. Finishing/sealing: application of protective or decorative finishes and cleaning.
9. Repairs: repairs to existing works.

Element to which activity relates

1. General: items that are applicable to all aspects of the installation.
2. Substrate: material, structure or other system to which the specified item is to be installed.
3. Component: part of the specified product, e.g. glazed unit to window.
4. Sundry items: other materials or products that form an essential element of the construction item, e.g. primer, separating membrane.
5. Accessories: optional products not essential to the construction of the specific works, i.e. window locks, integral blinds.
6. Finishes: applied finish to the component or system material, e.g. sealer.
7. Joints: materials or description of the method of working used to form joints, i.e. expansion/movement joints.
8. Barriers: materials used to form barriers in openings or voids created by the system, i.e. cavity barriers.
9. Fixtures and fittings: items added after the completion of the system and typically installed by another trade or subcontractor.
10. Services: items relating to services or services required to support the system (architectural specifications only).

Samples, Tests, Certificates, etc

Samples

Samples may be needed to confirm compliance with the performance and, or, workmanship requirements set out in the specification or to provide a benchmark for the quality of a product or workmanship.

Four different types of sample that may be requested are:

- **Product Samples:** to review the products before orders are placed and work commenced.
- **Sample Boards:** to review a number of products presented together in a manner that is reflective of their final arrangement within the works before orders are placed and work commenced.
- **Sample Panels:** to review a number of products in a manner that is indicative of the final works in order to provide a benchmark for workmanship prior to the placement of order and, or, commencement of works.
- **Sample Areas:** a finished portion of the works can be used as a benchmark for the remainder of the works.

The approval process must be set out either in the clause or in the Contract Preliminaries. Clauses requesting samples should set out:

- Samples to be provided, giving clause references of materials and products.
- Date of inspection.
- Notice Period.
- The review period to be allowed for by the Contractor and the Employer's Agent.
- Whether approval is required before orders are place.
- The extent and purpose of any approval given.
- What supporting information, i.e. technical literature, is required.
- Period for which approved samples are to be retained by the Contractor.

The type of sample requested, the timing and location of samples panels/areas and approval periods should be considered in relation to the size and scope of works together with the level of disruption to the works, sequence of site trades, and any associated costs that might result.

The stated review period needs to take into account the time taken to review the sample product with all relevant stakeholders. It must also consider timeframes for the selection, approval and ordering of alternatives or undertaking remedial works in the event that the sample does not meet the requirements of the Designer or Employer.

Tests

Clauses under this section set out which tests are to be carried out as part of the Contracted works. Tests will generally be requested in order to confirm compliance with specified performance requirements and levels of workmanship.

Details of additional inspections or tests that the Employer may wish to instruct during the course of the works should be incorporated within the Contract Preliminaries.

Clauses instructing the testing of the works or elements thereof need to set out:

- The items and properties to be tested.
- The criteria to be achieved.
- Specific methodology to be followed, e.g. in accordance with BS 8000.

- The need for testing to be carried out by a recognised testing agency or laboratory.
- Requirement for tests to be witnessed, when and by who.
- Notice period to be provided by the Contractor.
- How results are to be recorded and distributed.
- Analysis of the results.
- Provision by the Contractor of a statement detailing proposed remedial action where required test results are not achieved.

Certificates & Warrantees

Certificates and warrantees may be requested to demonstrate the quality or source of materials/products utilised, compliance of the works with the specification, and, or, the quality of workmanship.

Clauses instructing the provision of certificates and warrantees should set out:

- Certificates to be obtained.
- Information to be provided on the certificate.
- Date the certificate was issued.
- Responsibility for obtaining them.
- How many copies.
- Recipients including where the original should be sent.
- When they are to be submitted (e.g. before or after Practical Completion).

If certificates or warrantees are issued as evidence of test results a separate clause is not required.

Spares & Tools

Where the Contractor is to supply the employer with spares and tools at Practical Completion stipulate:

- List of items, including quantities.
- When spares and tools are to be supplied, e.g. 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 details specific to each Works Section may however be specified within an appropriate clause. These may include:

- Documents and training required.
- Who is to deliver the training, i.e. Contractor, installer or manufacturer.
- Where and when training is to be provided.

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