

Specification Writing

Selecting and specifying the most appropriate materials and systems for a project to meet regulations, and the client's requirements and expectations of quality, time, value, environmental impact, durability and maintenance is a fundamental part of building design.

This paper highlights the importance of specifications, specification methods and the structure of technical information. It provides advice on using the AUS-SPEC and NATSPEC systems, specifying ESD and suggests standards for use by offices of different disciplines.

Prepared by

NATSPEC

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SPECIFICATION - PROCESS AND PRODUCT**1 THE IMPORTANCE OF THE SPECIFICATION**

There are many design decisions which cannot be expressed in drawn form. These must rely on being expressed in words. There are, also, many design decisions which would be too tedious, or too impractical for some other reason, to be recorded in drawings. The specification is thus created to complement the drawings so that together they convey all the design decisions. This is why a construction specification is primarily a design document. It is evidence of many design decisions which are not found elsewhere.¹

1.1 Definition

The specification can be defined as both a process and a product. Specifications are written descriptions of the required quality of the built product and its component products. A specification may also include the procedures for determining that the requirements of the specification have been met.

1.2 Purpose

The specification links the drawings with the general conditions of contract. It complements, without duplication, the information in the drawings or the general conditions of contract. Drawings are graphic descriptions which primarily define quantity, position and sometimes quality. Specifications are written descriptions which define quality. Used together they express the designer's intentions.

The specification has many roles, including:

- A document demonstrating compliance with statutory requirements.
- A written record of design decisions, materials required and standards to be adhered to.
- An estimating document.
- A tendering document.
- A legal, contractual document.
- An on-site working document.
- A dispute settlement document.
- A project management tool.
- A facilities management tool.

1.3 Users

Designers, clients, certifying authorities, estimators, tenderers, contractors and subcontractors, contract administrators, legal representatives, project managers, construction managers and facilities managers all have an interest in the specification. It is important to ensure the various users interpret the specification in the same way. A good specification will:

- Answer the questions posed by the client, the National Construction Code (NCC) and local requirements.
- Cover the total range of the project elements.
- Have a logical structure which is easy to navigate.
- Cite other documents precisely and meaningfully.
- Have a consistent approach to grammar and language.
- Be unambiguous.
- Complement the drawings and be consistent with the other documents and the method of procurement.

National Construction Code (NCC) Abbreviations

NCC: National Construction Code.

BCA: National Construction Code Series Volume One: Building Code of Australia Class 2 to Class 9 Buildings and Volume Two: Building Code of Australia Class 1 and Class 10 Buildings.

PCA: National Construction Code Series Volume Three: Plumbing Code of Australia.

1. Standen (1995)

SPECIFICATION METHODS

2 TYPES OF SPECIFICATION CLAUSES

It is not difficult to peruse a sampling of specifications and to discern some basic and distinct styles or methods adopted by different specifiers and even by the same specifier, for differing reasons, in the same specification.¹

2.1 Descriptive

A descriptive specification clause describes in detail the materials, workmanship and installation required to be used by the contractor or tradesperson. In practice, many specification clauses are a combination of descriptive and performance specifications.¹

For example:

Fabrics: 3 mm diameter piping beads with core.

2.2 Reference

A reference specification clause is a reference to a published document, with which processes and products must comply. It is incorporated by a reference to the title or other identification of the document which may be a standard or a manufacturer's manual.

For example:

Grading to AS/NZS 2269.0: Plywood - structural - specifications.

Know the standard before you use it, and enforce it after you have used it.²

On the currency of cited standards, NATSPEC 0171 *General requirements* contains the following text:

All referenced documents are the editions, with amendments, current on dd/mm/yyyy (1st September or 1st March, as appropriate to current NATSPEC update). If statutory requirements reference other editions or standards, conform to those other editions or standards. Where the NCC (2022) references editions other than the current edition, the same editions cited in the NCC (2022) are referenced in each worksection.

Editions cited in the NCC for example, may not accord with the current edition, hence the exception.

2.3 Performance

A performance specification clause specifies an item in a construction project by prescribing a desired end result and the criteria by which the result will be judged for its acceptability.²

For example:

Pole taper: Maximum 1 in 120.

The NCC has Performance Requirements that can be met by either *Deemed-to-Satisfy Solutions* or *Performance Solutions*. The NCC defines these terms as follows:

Performance Requirements: A requirement which states the level of performance which a *Performance Solution* or *Deemed-to-Satisfy Solution* must meet.³

Deemed-to-Satisfy Solution: A method of satisfying the *Deemed-to-Satisfy Provisions*.³

Deemed-to-Satisfy Provisions: Provisions which are deemed to satisfy the *Performance Requirements*.³

Performance Solution: A method of complying with the *Performance Requirements* other than by a *Deemed-to-Satisfy Solution*.³

2.4 Direct/Proprietary

The specification of an item in a construction project by reference to a proprietary trade name.⁴

For example:

*Coating systems: Apply XYZ paints coating systems to the **Exterior painting schedule** and the **Interior painting schedule**.*

Standards

If relevant, AUS-SPEC and NATSPEC cite standards for materials and installations.

Some 110 of the NCC referenced standards are cited in NATSPEC specification text (*Normal style text*).

A further 1260 non-NCC standards are also cited.

In the *Guidance* text, some 325 additional standards are cited.

Where a standard is cited, the specifier may choose to retain it, nominate a proprietary product or delete the standard altogether if appropriate.

If no standards exist for a specification item, performance criteria are provided.

Many standards are themselves explicitly performance based, such as: AS/NZS 2728 *Prefinished/prepainted sheet metal products for interior/exterior building applications - Performance requirements*.

Refer to NATsource for a complete listing of *Normal style text* standards cited in NATSPEC and AUS-SPEC specification packages.

1. Standen (1995)
2. Norman (1977)
3. NCC 2022
4. Standen (2001)

USING THE NATSPEC SYSTEM

3 TECHNICAL INFORMATION

The technical matter in the specification must of necessity cover a very wide range of trades, materials, equipment, applications and practices...The grouping of this material into logical subdivisions is the obvious starting point in the preparation of a specification.¹

3.1 Technical worksection Templates

NATSPEC uses the term *worksection* to describe the foundation unit of a specification. Some worksections are trade based (e.g. brick and blockwork) and others follow processes (e.g. windows, lining).

In NATSPEC, each worksection is provided as a *Template* for the specifier to customise by completing prompts, adding relevant material and deleting material which is not applicable to the particular project.

Specification information typically includes finishes, standards, quality, material grades and thicknesses, tolerances, performance requirements, and requirements for fabrication and installation. Both drawings and specifications must address the NCC and other relevant state and local regulations and reflect good practice in the particular activities.

NATSPEC worksections can be generic or branded. A generic worksection is general and comprehensive. Branded worksections are developed by NATSPEC in conjunction with the manufacturer (known as a Product Partner). Branded worksections are generally based on the associated generic worksection and share the same classification number.

3.2 The National Classification System

Worksections need to be classified and sequenced in a logical order, responding to common local construction industry sequence. Locations need to be allocated for specification material provided by the various specialist designers and consultants.

The National Classification System provides locations for specification material produced by the architect and landscape architect, the interior designer, the civil and structural engineer, and the mechanical, hydraulic and electrical engineers. It is a modified version of the 1989 NATSPEC Classification system by Bryce Mortlock (the father of NATSPEC) and Hans Milton (a former chairman of the National Committee on Rationalized Building).

In 2007 NATSPEC incorporated AUS-SPEC, used by Local Councils for the life-cycle management of assets, into the National Classification System. Many new workgroups and worksections have been added as a result. At present the workgroups include:

- | | |
|---------------------------------|--|
| 00. Planning and design | 11. Construction - Road reserve |
| 01. General | 13. Construction - Public utilities |
| 02. Site, urban and open spaces | 14. Maintenance and operations - Urban and open spaces |
| 03. Structure | 15. Maintenance and operations - Buildings |
| 04. Enclosure | 16. Maintenance and operations - Road reserve |
| 05. Interior | 17. Maintenance and operations - Bridges |
| 06. Finish | 18. Maintenance and operations - Public utilities |
| 07. Mechanical | 20. Conveying |
| 08. Hydraulic | |
| 09. Electrical | |
| 10. Fire | |

As new worksections are produced, they are added to the system. Users may wish to add their own worksection titles and classification numbers where no material is currently provided.

Product Partners

NATSPEC Product Partners include:

AMETALIN
ANCON
ASKIN
ASSA ABLOY
AWS
BLUEDOG FENCES
BLUESCOPE
BREEZWAY
CAPRAL ALUMINIUM
CS CAVITY SLIDERS
CSR HIMMEL INTERIOR SYSTEMS
DANPAL
DCTECH
DELTA PANELS
DINCEL
DRIBOND CONSTRUCTION CHEMICALS
DTAC
DUCTUS
DULUX
ENVU
ESCEA
EVAPCO
EZI-ROLL
FIELDERS
FORBO
FOSROC
GETZNER VIBRATION SOLUTIONS
GRIFCO
HAYMES
HILTI
KINGSPAN INSULATION
KINGSPAN INSULATED PANELS
LAWN SOLUTIONS
LYSAGHT
MODDEX
PALRAM
RAVEN
REGUPOL
RESENE
RONDO
SAFETYLINE JALOUSIE
SOPREMA
STRAMIT
STRACO
TAUBMANS
TERMIMESH
TERMSHIELD
WATTYL

Relevant NATSPEC TECHnote:
GEN 008 Branded vs generic worksections
1. Standen (1995).

USING THE NATSPEC SYSTEM

3.3 Worksection structure

In NATSPEC, each worksection *Template* is generally divided into four parts (subsections): GENERAL, PRODUCTS, EXECUTION and SELECTIONS.

1. GENERAL contains clauses applying to the worksection as a whole, including:

- Responsibilities.
- Cross references.
- Standards.
- Interpretation.
- Tolerances.
- Submissions.
- Inspection.

2. PRODUCTS describes the basic materials, components and fabricated items.

3. EXECUTION sets out the performance criteria to prepare the substrate, assemble materials to produce an installation and carry out the works.

4. SELECTIONS contains schedules that refer to generic products by their properties or to the selection of actual proprietary products by the specifier for the project. These schedules can be included in the specification or on the drawings.

The *Templates* are further structured into a hierarchy of clauses, subclauses, paragraphs, prompts, tables, schedules and references with *Guidance* notes provided in hidden text.

Subsection title (Heading 2)	Clause title (Heading 3)	Subclause title (Heading 4)	Paragraph (Normal)	Prompt	Guidance
1	PRODUCTS				
1.1	TIMBER				
	Posts and rails				
	Hardwood:				
	- Standard: To AS 2082.				
	Softwood:				
	- Standard: To AS 2858.				
	Delete references to the standards if you are prepared to accept local industry practice or prefer to use locally accepted terms. A preservative treated radiata pine fence will almost certainly be a more economic proposition compared with hardwood fencing. AS 2082 and AS 2858 apply, respectively, to hardwoods and softwoods for structural purposes.				
	- Stress grade: [complete/delete]				
	Select from F5 to F7.				
	Pickets and palings				
	Hardwood: To AS 2796.1, Section 8.				
	- Grade to AS 2796.2: Select.				
	Softwood: To AS 4785.1, Section 7.				
	Seasoned cypress pine: To AS 1810, Section 5.				
	Preservative treatment				
	Timber type: Provide only timbers with preservative treatment appropriate to the Hazard class.				
	Cut surfaces: Provide supplementary preservative treatment to all cut and damaged surfaces.				
	CCA treated timber: If proposed to be used, provide details.				

In AUS-SPEC, *Templates* are similar to NATSPEC *Templates* but the parts (subsections) differ to suit the AUS-SPEC content.

AUS-SPEC Design *Templates* are generally divided into: GENERAL, PRE-DESIGN PLANNING, DESIGN and DOCUMENTATION.

AUS-SPEC Construction *Templates* are generally divided into GENERAL, PRE-CONSTRUCTION PLANNING, MATERIALS, EXECUTION, and ANNEXURES.

Quality Management

NATSPEC addresses quality management systems in *0121 Tendering* and *0160 Quality* and in each technical worksection where product quality, quality control and quality assurance are covered.

NATSPEC requires reports for various matters including:

- Emergency construction joints.
- Geotechnical investigation.
- Load tests.
- Nominated tests.
- Non-conforming products.
- Physical performance.
- Termite control systems.
- Waterproofing membranes.

NATSPEC'S *0171 General requirements* and other worksections, where appropriate, cover:

- Completion tests.
- Pre-completion tests.
- Production tests.
- Progressive tests.
- Site tests.
- Type tests.

Many standards cover tolerance. Where there is an absence of tolerance requirements, NATSPEC generally provides tolerance defaults.

USING THE NATSPEC SYSTEM

4 PROJECT SPECIFIC INFORMATION

4.1 Tender

The tender documents are pre-contract documents. The tendering worksection notes conditions of tender and does not form part of the contract. Items covered in NATSPEC's tendering worksection include:

- Description of works.
- Site description.
- List of tender documents.
- Contact details.
- Tender information (e.g. tender period, procedures).
- Tender requirements.
- Tender form.

AUS-SPEC worksections also include Schedule of rates.

Tendering is a separate self-contained transaction which terminates with the awarding of a contract. The technical worksections make no reference to tendering.

4.2 Preliminaries

Preliminaries cover project-specific and site requirements of the owner, not included in standard contracts, which do not constitute work that could be allocated to a particular worksection. Items might include:

- Contract documents.
- Surveys.
- Protection of persons and property.
- Railings and hoardings.
- Temporary buildings.
- Signboard.
- Site meetings.
- Site noise control.
- Adjoining properties.
- Provisional quantities.
- Temporary services.
- Occupancy requirements.

NATSPEC provides both generic preliminaries worksections as well as preliminaries *Templates* for the following contracts:

- ABIC BW-2018 C Australian Building Industry Contract – Basic works.
- ABIC MW-2018 Australian Building Industry Contract – Major works.
- ABIC SW-2018 Australian Building Industry Contract – Simple works.
- AS 2124 (1992) General conditions of contract.
- AS 4000 (1997) General conditions of contract.
- AS 4902 (2000) General conditions of contract for design and construct.
- AS 4905 (2002) Minor works contract conditions (Superintendent administered).
- NCW4 2019 (National Capital Works) - General conditions of contract for construction.

4.3 General requirements

0171 General requirements covers administrative topics common to all the technical worksections and is cross referenced by each technical worksection. Items include:

- Interpretation.
- Inspection.
- Tests.
- Samples.
- Submissions.
- Substitution.
- Completion.
- Warranties.

4.4 Common requirements

The *018 Common requirements* workgroup covers material relating to more than one worksection. Rather than repeating the same material over many worksections, NATSPEC gathers it into single worksections which include:

- Adhesives, sealants and fasteners.
- Timber products, finishes and treatment.
- Fire-stopping.
- Metals and prefinishes.
- Termite management.

Procurement methods

The NATSPEC material generally addresses a single contractor in a single prime contract, but it may also be used to produce different types of specifications for different contracts and procurement such as:

- Alliance.
- Design and construct contracts.
- Managing Contractor.
- Public Private Partnership (PPP).
- Single trade packaging contracts.

See NATSPEC TECHreports *TR 03 Specifying design and construct for mechanical services*, and *TR 06 Procurement: Past and present*.

NATSPEC includes:

- 1 Tendering worksection.
- 10 Contract preliminaries worksections.
- 247 Full technical worksections.
- 29 Basic technical worksections.
- 85 Branded worksections.
- 207 AUS-SPEC worksections.

USING THE NATSPEC SYSTEM

5 USING NATSPEC

5.1 General

NATSPEC is a National Master Specification for use with projects of different types and sizes. As a master specification system, it will not contain all the technical requirements for every project. For each project, the specifier will need to select the appropriate NATSPEC worksections and edit the material to suit the project.

Editing may include:

- Deletion of inappropriate options where the NATSPEC *Template* provides mutually exclusive options (e.g. different roofing or door frame assembly types).
- Deletion of lengthy prescriptive or performance material where a proprietary specification is appropriate and is permitted by the client.
- Deletion of clauses with prompts where schedules or drawings are better suited to conveying the information (e.g. location).
- Deletion of NATSPEC material intended only for custom-made options or for generic specifying. Many items are not usually custom-made (e.g. roller shutters and luminaires).
- Allowance for silence in the documents, permitting the contractor to decide on the method, material, or quality to use, where the *Templates* offer acceptable alternatives from which the contractor must choose. The contractor may reasonably be expected to select some appropriate, minor materials (e.g. fasteners, adhesives) in any case.
- Deferral to the NATSPEC default provision (e.g. AS/NZS 4455.1 for masonry units, AS/NZS 3982 for urinals) where satisfactory.
- Deletion of **Prototypes**, **Samples** and **Tests** clauses and subclauses where they are not warranted by the size and complexity of the project. Note that testing of structural elements such as concrete, and other elements which are built to a performance specification, is always advisable.
- Revision of the default quality level so that it is above the industry standard, or the requirement level stipulated in the NATSPEC documents, after determining the quality level available in the market.
- Additional requirements not covered in the NATSPEC worksections, e.g. additional performance testing or specific submissions.

5.2 Office edited worksections

NATSPEC *Templates* can be pre-edited to create Office edited worksections to include:

- Office policies on the use of some materials and components.
- Office specialist project material.

For example, a practice specialising in housing might delete the material which is never required for this class of project. Default proprietary items can also be pre-selected at this stage. The pre-edited document can then be used as an Office Master file for all housing specifications. Conversely, practices dealing with schools may need to prepare additional standard worksections or subsections.

Choosing an appropriate starting point is critical. Rather than altering NATSPEC material, which may complicate the updating process, consider preparing office or project type specifications.

Offices can also prepare standard prompts with office preferred schedules which specifiers can insert into the NATSPEC *Templates* at appropriate points.

5.3 Unique project worksections

NATSPEC does not cover everything. If it is necessary to create your own unique project worksections, select the NATSPEC worksection that is closest to the one you need. Follow the sequence for creating an Office edited worksection, giving the worksection a new name and classification number. The classification number allows you to place the Office edited worksection where you wish it to appear in the specification.

Office edited worksections

Some offices have set standard design criteria for the majority of their projects. Office edited worksections can be developed and stored with the NATSPEC worksections as an Office Master System. This is useful where an office routinely:

- Includes Office edited worksections not covered by NATSPEC.
- Re-orders worksections to suit their documentation system.
- Includes performance text and standard selections.
- Incorporates text based on office and site experience.
- Customises to house style.

Create your own worksections if NATSPEC does not have one that you need. Consider sending these to NATSPEC for consideration for future inclusion via email at mail@natspec.com.au.

Relevant NATSPEC
TECHnote:

GEN 007 Making sure your specifications are up-to-date.

USING THE NATSPEC SYSTEM

5.4 Step-By-Step

The following is a step-by-step guide on how to produce a specification from NATSPEC *Templates*. Refer to *QUICKstart* on SPECbuilder Live.

MAINTENANCE

Step 1 - Update office edited master files

Make sure each project specification incorporates standards and mandatory requirements current at the time of writing.

GENERIC EDITING AND PLANNING

Step 2 - Reformat Templates

Refer to *NATSPEC Specification Word Processing and Production* on formatting NATSPEC *Templates* in line with office policy on document style, if required.

Step 3 - Office edited worksections

Collect material such as office policy requirements, client requirements (e.g. preliminaries) and project type supplements (e.g. schools). If possible, obtain electronic copies of client requirements in a suitable format. Draft new text in NATSPEC style.

Step 4 - Select the working version of Templates for your project

Decide which updated *Template* version will best suit the project specification e.g. NATSPEC Domestic, Basic or Professional or Office edited worksection *Templates*.

Step 5 - Select worksections required

Use SPECbuilder to select worksections required for the new project specification and compile a draft specification.

Step 6 - Decide on working medium: Digital or hardcopy mark-ups

Decide whether to customise the *Templates* directly on-screen, or by first marking-up paper copies. The first review - at worksection, subsection and clause level - can be on-screen. Subsequent reviews can be marked up on printed copies. Print out as late as possible to reduce the bulk of the master document for marking up.

Step 7 - Decide on a working pattern

Be systematic and keep a record of work which is planned and completed. Take time and resource restraints (budget, number and grade of personnel) into consideration when preparing the program.

The working pattern will be influenced by the procurement method. For example, in Multiple Contracting, a particular worksection package, such as windows, will be required early in the process (due to lead times off-site) whereas the painting package may commence later.

TECHNICAL CUSTOMISING

Step 8 - Identify clauses not required

Delete unnecessary clauses from the worksections. Highlight uncertain clauses and leave until later.

At this stage, it is often best to concentrate on completing particular worksections rather than jumping from one to the other.

Step 9 - Identify subclauses not required

Delete unnecessary subclauses (and associated prompts) from the worksection. Highlight uncertain subclauses and associated prompts and leave until later.

Step 10 - Identify paragraphs and subparagraphs not required

Delete unnecessary paragraphs and subparagraphs (and associated prompts). Refer to the hidden *Guidance* text.

Step 11 - Complete the write-in options

Complete the options, [complete/delete] prompts and schedules.

NATSPEC is a system of specification worksection *Templates*, for use in the preparation of a project specific specification.

SPECbuilder is an online specification compilation tool which helps you to manage, create and edit your project specifications.

USING THE NATSPEC SYSTEM

Step 12 - Add new material

Add original material not in the NATSPEC *Templates* (although sometimes mentioned in the *Guidance* text) where required.

Check against standards and other technical literature, particularly for availability and the variables, which need to be specified. Begin with the worksections about which you know the most. Use the NATSPEC style.

Step 13 - Edit standard text

Systematically edit standard (default) NATSPEC *Template* text where it conflicts with project requirements, the drawings, completed prompts or with added new material. In particular, default standards or descriptions may conflict with proprietary items.

If required, you may insert hyperlinks into the worksection text for office or client policy requirements. Standard NATSPEC *Template* text may also be modified to incorporate a preferred style or where greater detail is required. A word of warning: the more this is done, the less valuable the standard text becomes and the more work for the specifier.

Optional style text (blue with a grey background) covers items specified less frequently. It is provided for incorporation into *Template* text where it is applicable to a project.

Step 14 - Complete

Run through steps 8 to 13 as often as required until the project specification is complete. In particular make sure all NATSPEC text options have been considered, all defaults evaluated and all prompts completed/deleted. Make sure that no uncertain items remain – if in doubt at this stage, leave them out.

EDITORIAL CUSTOMISING AND PRODUCTION

Step 15 - Check cross references

Check all cross references in the project specification to other worksections, standards, referenced documents, and contract documents. Make sure, in particular, that cross referenced material has not been accidentally deleted (thereby creating conflict). Minimise repetition and make sure there is no conflict between drawings and the specification.

Step 16 - Proofread

Consider printing a hardcopy and proofread (perhaps several times). Check the format, number the pages, finalise the contents and prepare a table of contents.

Step 17 - Correct

Check details again. MS Word allows you to easily renumber subsections and clauses. Add headers, footers and issue/revision Tables in accordance with office policy. Distribute to the principal, consultants, tenderers and other relevant parties. Retain working and library/archive copies.

Styles and formatting

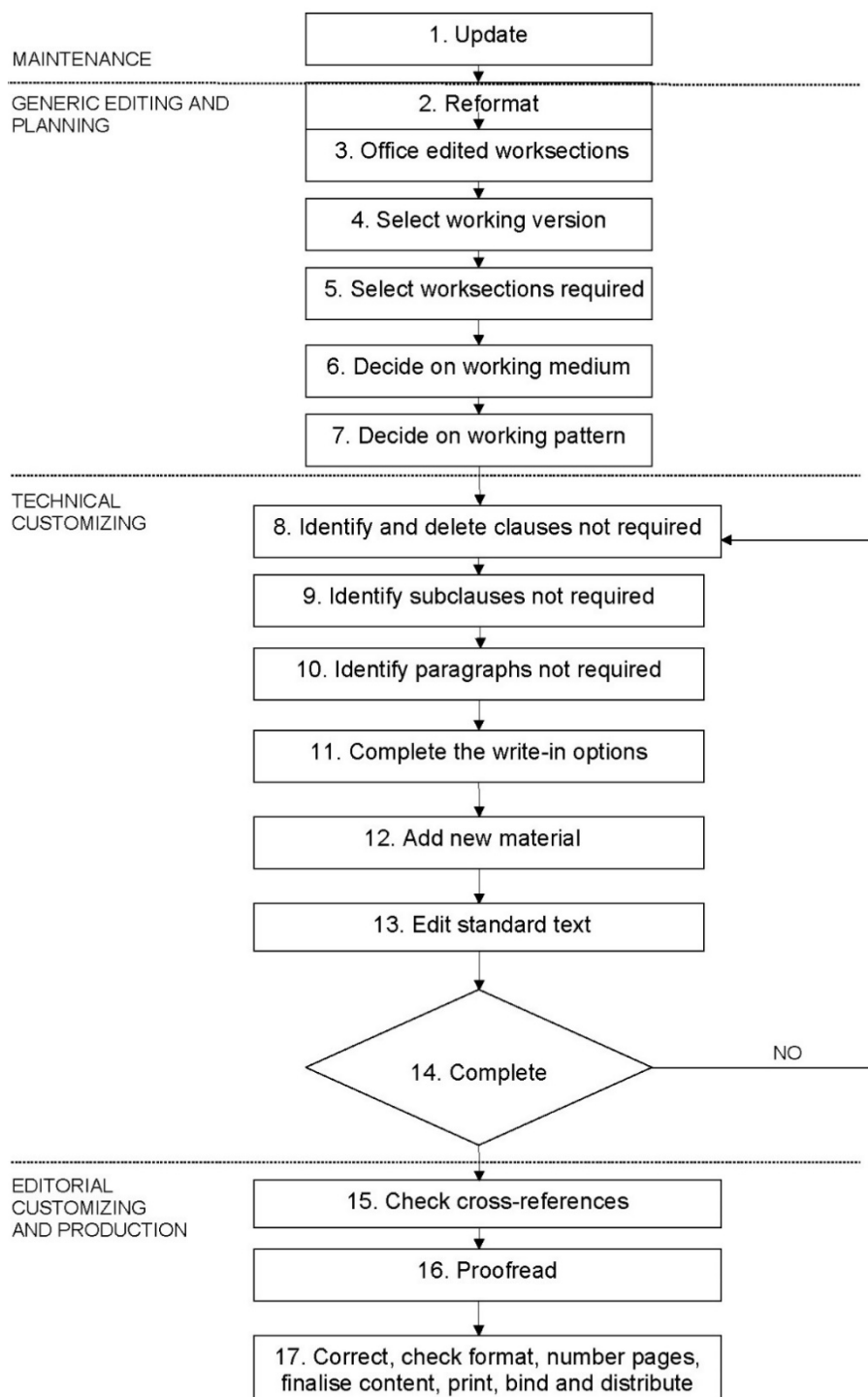
NATSPEC *Templates* have an attached .dot file which holds information about format including headings.

See also the NATSPEC STYLEguide.

The structure provided by NATSPEC's formatting style facilitates easy referencing of information in the specification.

USING THE NATSPEC SYSTEM

NATSPEC SPECIFICATION WRITING PROCESS



Substitution

NATSPEC worksections are written in generic terms, though many worksections will be made proprietary by the specifier.

If a specifier chooses a product, much of the NATSPEC material becomes redundant and should be deleted.

NATSPEC's *0171 General requirements* permits substitution of documented products, methods or systems provided certain conditions are met.

For example:

Availability: If the documented products or systems are unavailable within the time constraints of the construction program, submit evidence.

Relevant NATSPEC TECHnote: *GEN 006 Product specifying and substitution.*

ADVICE FOR SPECIFIERS

6 ECOLOGICALLY SUSTAINABLE DEVELOPMENT (ESD)

6.1 The role of specifications in ESD

An ESD specification focuses on:

- Giving effect to ESD design decisions not shown on the drawings.
- Specifying ESD appropriate materials and methods of construction.
- Specifying components and products that permit the implementation of ESD.

6.2 Implementing ESD principles

The specification can be used to implement specific ESD principles in a number of broad categories:

- Energy conservation and greenhouse gas reduction.
- Conserving other consumables such as water.
- Using ESD appropriate materials, for example, materials with low volatile organic compound (VOC) emissions.
- Creating a quality environment, both inside and outside the building, based on ESD principles.

6.3 Specifying ESD with NATSPEC

To assist the specifier in achieving the full ESD potential of the design, NATSPEC:

- Provides industry with a comprehensive specification system that can be used for varying means of building procurement.
- Recognises that most aspects of ESD relating to buildings are design issues and that a primary function of the specification is to give effect to design decisions.
- Does not mandate ESD but provides options for specifiers to choose and adopt ESD principles. *Guidance* text, highlighting areas of ESD potential, is included within the worksection *Templates*.
- Does not attempt to arbitrate on competing claims made for the sustainability or otherwise of materials or methods and instead aims to present specifiers with impartial information that can be used to make informed decisions.
- Provides material for use in specifying ecologically sustainable, non-traditional construction materials and methods such as *0361 Monolithic stabilised rammed earth walls*.
- Provides a means for meeting mandatory ESD requirements to the extent that these can be handled through the specification process.

6.4 NATSPEC, ESD and the NCC

The NCC incorporates a number of mandatory environmental provisions. These primarily relate to energy conservation and greenhouse gas reduction but include improving the comfort and amenity of buildings for their occupants.

NATSPEC's TECHreport *TR 01 Specifying ESD* indicates which worksections can be used to document provisions conforming to NCC requirements and the ESD commitments necessary to meet NCC objectives. This is particularly relevant when the design is for a verification-based Performance Solution, rather than the *Deemed-to-Satisfy Provisions* of the NCC.

6.5 NATSPEC, ESD and environmental rating schemes

Many designers and specifiers adopting an ESD approach will also be seeking to achieve specific targets against voluntary environmental rating schemes such as NABERS and Green Star. NATSPEC can be used for specifying products and components to meet GBCA Green Star commitments.

ESD Rating

Achieving a star rating and complying with the Energy Efficiency in Government Operations (EEGO) policy largely involves design decisions, some of which need to be given effect through the specification.

The NATSPEC TECHreport, *TR 01 Specifying ESD*, provides a valuable overview of how to use the NATSPEC system to specify buildings incorporating ESD principles and includes a matrix linking NATSPEC worksections and the ESD requirements of the NCC. The TECHreport, as well as TECHnotes about other ESD related issues, are available for free download from the *Technical Resources* section of www.natspec.com.au.

ADVICE FOR SPECIFIERS

7 ADVICE FOR SPECIFIERS

Brevity

- Use the imperative form. For example, Lay tiles.... rather than.... Tiles shall be laid.
- Avoid lengthy verbal descriptions – use NATSPEC style (e.g. colons and keywords), draw it or schedule it instead.

Clarity

- Use precise, consistent language, structure and terminology.
- Avoid legal phraseology or stilted formal terms and sentences.

Content

- Develop an office policy regarding what material will be included in the drawings, schedules and written specifications.
- Do not include material in technical worksections that should be covered in preliminaries, general conditions annexures or the general conditions themselves, e.g. tendering, contractual material, project descriptions, drawing lists.

Compliance

- Establish if any Performance Solutions to the NCC are to be pursued.
- Consider initially preparing a NCC compliance document comprising only those worksections relating to the NCC.

Consultants

- Check specifications and schedules provided by consultants for consistency.
- Do not duplicate material common to various project consultants.

Cross references

- Minimise cross references within the specification.
- Do not use phrases such as 'detailed on the drawings' or 'unless otherwise specified'. Use, 'as documented', making sure they are documented.

Fairness

- Be specific, so that a basis for pricing is clearly set.
- Do not specify anything which cannot be verified or which the contract administrator or the principal does not intend to enforce.

Redundancy

- Say it once and in the right place.
- Do not use redundant reference paragraphs at the start of each worksection. The contractor is responsible for all work and must read all documents together.

Repetition

- Avoid repetition within the specification and between the specification, drawings and other contract documents.
- Do not specify the same thing using a mix of proprietary, descriptive, performance or reference specification – conflict is bound to arise.

Standards

- Do not rely on a blanket instruction to comply with all relevant standards.
- Have access to the standards you need and evaluate their scope and currency.

Structure

- Break long clauses into subclauses, paragraphs and subparagraphs with titles or bullet points in a logical hierarchy, each dealing with one item.
- Standardise text of common clauses and subclauses.

Time

- Start documenting early, upon receipt of the client's brief.
- Establish the Conditions of Contract and check for items requiring early attention.

Contract administration

It is beyond the scope of NATSPEC to offer any management system to handle the approval process.

Consequently definitions and directions such as 'approved' do not appear as default text. If adding a definition, the following text may be useful:

Approved: 'Approved', 'reviewed', 'directed', 'rejected', 'endorsed' and similar expressions mean 'approved (reviewed, directed, rejected, endorsed) in writing by the contract administrator'.

ABOUT NATSPEC

8 ABOUT NATSPEC

NATSPEC Development

The development of NATSPEC material is driven by:

- The NCC, including state and territory variations on safety, health, amenity and energy aspects of buildings.
- Developments in some 2,000 standards and documents, mostly Australian, relating to the worksections, *Templates*, and *Guidance*.
- Feedback from its users including specifiers, contractors, industry organisations and manufacturers.
- The knowledge base of NATSPEC editorial staff.
- The direction of the 20 stakeholders, expressed through a seven-member board.

NATSPEC values feedback given by its users. Comments can be emailed to:

mail@natspec.com.au.

NATSPEC Updates

NATSPEC issues subscribers with a USB containing all worksections, including new, revised and branded, twice a year. At the same time, new and updated files are uploaded to SPECbuilder. NATSPEC subscribers are also kept informed via the quarterly publication, SPECnotes.

Additional information, available on the NATSPEC website includes:

- NATSPEC TECHnotes.
- NATSPEC TECHreports.

A quarterly listing of revised standards which relate to NATSPEC material is also available online to subscribers, as published quarterly in SPECnotes.

NATSPEC TECHnotes

TECHnotes are a series of one or two page notes prepared by NATSPEC to give specifiers general information on specification writing or technical topics that generally relate to more than one worksection. Titles are grouped into 3 categories: General (GEN), Design (DES) and Products (PRO).

NATSPEC TECHreports

TECHreports are in-depth reports prepared by NATSPEC to give general information on specification writing, and technical information that generally relates to more than one worksection e.g. *Specifying ESD*.

NATSPEC Branded worksections

Branded worksections are developed by NATSPEC in conjunction with the manufacturer, known as a Product Partner. Branded worksections follow NATSPEC style and format and offer specifiers an alternative to NATSPEC generic worksections.

NATSPEC Benefits

NATSPEC is a master specification system. It provides a baseline for good building practice. It is not an Australian standard or a governmental regulation. No one is compelled to adopt NATSPEC but many in the industry believe that it is in the industry's best interest to do so.

The benefits of using NATSPEC are:

- Clear, simple and common language between the professional consultants.
- Up-to-date references to regulations and standards.
- Economy. NATSPEC is produced by a centralised agency monitoring construction industry developments and, as a not-for-profit organisation, the benefits of this are transferred to subscribers and the industry as a whole.

REFERENCES AND FURTHER READING

9 REFERENCES

Books

- Gelder, John (2001), Specifying architecture.
 Norman, Douglas A. (1977), Specifications.
 Standen, David (1995), Construction industry specifications.
 Standen, David (4th edition, 2011), Construction industry terminology.

Article

- Peaslee, Horace W. (1939), Streamlined specifications, Pencil points magazine.
 Acumen practice notes (2022), Specification writing.

Standards

AS 2124:1992	General conditions of contract
AS/NZS 2269.0:2012	Plywood - Structural - Specifications
AS/NZS 2728:2013	Prefinished/prepainted sheet metal products for interior/exterior building applications - Performance requirements
AS/NZS 3982:1996	Urinals
AS 4000:1997	General conditions of contract
AS/NZS 4455.1:2008	Masonry units, pavers, flags and segmental retaining wall units - Masonry units
AS 4902:2000	General conditions of contract for design and construct
AS 4905:2002	Minor works contract conditions (Superintendent administered)
NCW4:2019	General conditions of contract for construction

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NATSPEC Quickstart	
TECHnote GEN 006	Product specifying and substitution
TECHnote GEN 007	Making sure your specifications are up-to-date
TECHnote GEN 008	Branded vs generic worksections
TECHreport TR 01	Specifying ESD
TECHreport TR 03	Specifying design and construct for mechanical services
TECHreport TR 06	Procurement: Past and present

Further reading



SUGGESTED STANDARDS FOR OFFICES

10 SUGGESTED STANDARDS FOR OFFICES

The following are lists of suggested references appropriate to offices dealing with typical projects. Many are design standards that must be complied with in order to meet National Construction Code (NCC) and other mandatory requirements while others are related handbooks. These are considered to be the foundation upon which other specialist and appropriate references are added. As with all standards, they must be kept up to date. Standards cited in the Building Code of Australia (NCC Volumes 1 and 2) are marked NCC 1 and 2, and Plumbing Code of Australia (NCC Volume 3) citations are marked NCC 3.

10.1 For All

AS 4120:1994	Code of Tendering
AS 4122:2010	General conditions of contract for consultants
AS 4299:1995	Adaptable housing
AS/NZS ISO 9001:2016	Quality management systems - Requirements
NCC:2022	National Construction Code

10.2 Architects

NCC 1,2	AS/NZS ISO 717.1:2004	Acoustics - Rating of sound insulation in buildings and of building elements -Airborne sound insulation
NCC 1	AS ISO 717.2:2004	Acoustics - Rating of sound insulation in buildings and of building elements -Impact sound insulation
NCC 1,2	AS 1288:2021	Glass in buildings - Selection and installation
NCC 1,2,3	AS 1428.1:2009	Design for access and mobility -General requirements for access - New building work
	AS 1428.1:2021	Design for access and mobility -General requirements for access - New building work
NCC 1,3	AS 1428.2:1992	Design for access and mobility -Enhanced and additional requirements - Buildings and facilities
NCC 1	AS/NZS 1428.4.1:2009	Design for access and mobility -Means to assist the orientation of people with vision impairment - Tactile ground surface indicators
NCC 1,2	AS 1562.1:2018	Design and installation of sheet roof and wall cladding -Metal
NCC 1	AS 1657:2018	Fixed platforms, walkways, stairways and ladders - Design, construction and installation
NCC 1,2	AS 1684.4:2010	Residential timber-framed construction -Simplified - Non-cyclonic areas
	AS 1735.1.1:2022	Lifts, escalators and moving walks -General requirements
NCC 1,2	AS 1860.2:2006	Particleboard flooring -Installation
NCC 1	AS 1905.1:2015	Components for the protection of openings in fire-resistant walls -Fire-resistant doorsets
NCC 1,2	AS 2047:2014	Windows and external glazed doors in buildings
	AS/NZS 2311:2017	Guide to the painting of buildings
	AS 2312.1:2014	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings -Paint coatings
	AS/NZS 2312.2:2014	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings -Hot dip galvanizing
	AS/NZS 2589:2017	Gypsum linings - Application and finishing
	AS 2601:2001	The demolition of structures
NCC 1,2	AS 2870:2011	Residential slabs and footings
	AS/NZS 2890.1:2004	Parking facilities -Off-street car parking
	AS 2890.3:2015	Parking facilities -Bicycle parking
NCC 1	AS/NZS 2890.6:2022	Parking facilities -Off-street parking for people with disabilities
NCC 1	AS/NZS 2904:1995	Damp-proof courses and flashings
	AS/NZS 3000:2018	Electrical installations (known as the Australian/New Zealand Wiring Rules)
NCC 1,2	AS/NZS 3500.3:2021	Plumbing and drainage -Stormwater drainage
NCC 1	AS 3660.1:2014	Termite management -New building work
	AS 3660.2:2017	Termite management -In and around existing buildings and structures
	AS 3660.3:2014	Termite management -Assessment criteria for termite management systems
NCC 1,2,3	AS 3700:2018	Masonry structures
NCC 1,2	AS 3740:2021	Waterproofing of domestic wet areas
	AS 3958.1:2007	Ceramic tiles -Guide to the installation of ceramic tiles

SUGGESTED STANDARDS FOR OFFICES

	AS 3958.2:1992	Ceramic tiles -Guide to the selection of a ceramic tiling system
NCC 1,2,3	AS 3959:2018	Construction of buildings in bushfire-prone areas
NCC 1,2,3	AS 4055:2021	Wind loads for housing
NCC 1	AS 4072.1:2005	Components for the protection of openings in fire-resistant separating elements -Service penetrations and control joints
NCC 1	AS 4200.2:2017	Pliable building membranes and underlays -Installation
	AS/NZS 4858:2004	Wet area membranes
NCC 1	AS/NZS 4859.1:2018	Thermal insulation materials for buildings -General criteria and technical provisions
NCC 1,2	AS/NZS 5601.1:2022	Gas installations -General installations
	AS 5604:2022	Timber - Natural durability ratings
	SA TS 5342:2021	Technical specification for building commissioning
NCC 1,2	NASH-1:2005	NASH Standard Residential and Low-rise Steel Framing - Design criteria
NCC 1,2	NASH-2:2014	NASH Standard Residential and Low-rise Steel Framing - Design solutions

10.3 Electrical Engineers

	AS/CA S009:2020	Installation requirements for customer cabling (Wiring Rules)
	AS/NZS 1367:2023	Coaxial cable and optical fibre systems for the RF distribution of digital television, radio and in-house analog signals in single and multiple dwelling installations
	AS 1428.5:2021	Design for access and mobility -Communication for people who are deaf or hearing impaired
NCC 1	AS 1670.1:2018	Fire detection, warning, control and intercom systems - System design, installation and commissioning -Fire
NCC 1	AS 1670.4:2018	Fire detection, warning, control and intercom systems - System design, installation and commissioning -Emergency warning and intercom systems
	AS 1670.5:2016	Fire detection, warning, control and intercom systems - System design, installation and commissioning -Special hazard systems
	AS 1670.6:2023	Fire detection, warning, control and intercom systems - System design, installation and commissioning -Smoke alarm systems
NCC 1	AS/NZS 1680.0:2009	Interior and workplace lighting -Safe movement
	AS/NZS 1680.1:2006	Interior and workplace lighting -General principles and recommendations
	AS/NZS 1680.2.1:2008	Interior and workplace lighting -Specific applications - Circulation spaces and other general areas
	AS/NZS 1680.2.2:2008	Interior and workplace lighting -Specific applications - Office and screen-based tasks
	AS/NZS 1680.2.3:2008	Interior and workplace lighting -Specific applications - Educational and training facilities
	AS/NZS 2201.1:2007	Intruder alarm systems -Client's premises - Design, installation, commissioning and maintenance
	AS 2201.2: 2022	Alarm and electronic security systems -Monitoring centres
NCC 1	AS/NZS 2201.5:2008	Intruder alarm systems -Alarm transmission systems
NCC 1	AS/NZS 2293.1:2018	Emergency lighting and exit signs for buildings -System design, installation and operation
	AS/NZS 2967:2014	Optical fibre communication cabling systems safety
	AS/NZS 3000:2018	Electrical installations (known as the Australian/New Zealand Wiring Rules)
	AS/NZS 3008.1.1:2017	Electrical installations - Selection of cables -Cables for alternating voltages up to and including 0.6/1 kV - Typical Australian installation conditions
NCC 1	AS/NZS 3013:2005	Electrical installations - Classification of the fire and mechanical performance of wiring system elements
	AS/NZS 3084:2017	Telecommunications installations - Telecommunications pathways and spaces for commercial buildings
	AS/NZS 3439.1:2002	Low-voltage switchgear and controlgear assemblies -Type-tested and partially type-tested assemblies
	AS/NZS 3439.3:2002	Low-voltage switchgear and controlgear assemblies -Particular requirements for low-voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access for their use - Distribution boards
	AS/NZS 4282:2023	Control of the obtrusive effects of outdoor lighting

SUGGESTED STANDARDS FOR OFFICES

AS/NZS 11801.1:2019	Information technology - Generic cabling for customer premises - General requirements (ISO/IEC 11801-1:2017, MOD)
AS 11801.2:2019	Information technology - Generic cabling for customer premises -Office premises (ISO/IEC 11801-2:2017, MOD)
AS 11801.4:2019	Information technology - Generic cabling for customer premises -Single-tenant homes (ISO/IEC 11801-4:2017, MOD)
AS/NZS 61439.1:2016	Low-voltage switchgear and controlgear assemblies -General rules (IEC 61439-1, Ed. 2.0 (2011), MOD)
AS/NZS 61439.3:2016	Low-voltage switchgear and controlgear assemblies -Distribution boards intended to be operated by ordinary persons (DBO) (IEC 61439-3, Ed 1.0 (2012), MOD)
SA TS 5342:2021	Technical specification for building commissioning

10.4 Fire Services Engineers

	AS/NZS 1221:1997	Fire hose reels
NCC 1	AS 1670.1:2018	Fire detection, warning, control and intercom systems - System design, installation and commissioning -Fire
NCC 1	AS 1670.4:2018	Fire detection, warning, control and intercom systems - System design, installation and commissioning -Emergency warning and intercom systems
	AS 1670.5:2016	Fire detection, warning, control and intercom systems - System design, installation and commissioning -Special hazard systems
	AS 1670.6:2023	Fire detection, warning, control and intercom systems - System design, installation and commissioning -Smoke alarm systems
NCC 1	AS 2118.1:2017	Automatic fire sprinkler systems -General systems
NCC 1,3	AS 2118.4:2012	Automatic fire sprinkler systems -Sprinkler protection for accommodation buildings not exceeding four storeys in height
NCC 1,3	AS 2118.6:2012	Automatic fire sprinkler systems -Combined sprinkler and hydrant systems in multistorey buildings
NCC 1,3	AS 2419.1:2021	Fire hydrant installations -System design, installation and commissioning
	AS 2419.2:2009	Fire hydrant installations -Fire hydrant valves
NCC 1,3	AS 2441:2005	Installation of fire hose reels
	AS/NZS 3000:2018	Electrical installations (known as the Australian/New Zealand Wiring Rules)
	AS/NZS 3008.1.1:2017	Electrical installations - Selection of cables -Cables for alternating voltages up to and including 0.6/1 kV - Typical Australian installation conditions
NCC 1	AS/NZS 3013:2005	Electrical installations - Classification of the fire and mechanical performance of wiring system elements
	AS 4118.1.4:1994	Fire sprinkler systems -Components - Valve monitors
	AS 4809:2017	Copper pipe and fittings - Installation and commissioning
	SA TS 5342:2021	Technical specification for building commissioning

10.5 Hydraulic Engineers

	AS/NZS 1221:1997	Fire hose reels
	AS/NZS 1596:2014	The storage and handling of LP Gas
	AS/NZS 2032:2006	Installation of PVC pipe systems
	AS/NZS 2033:2008	Installation of polyethylene pipe systems
NCC 1	AS 2118.1:2017	Automatic fire sprinkler systems -General systems
NCC 1,3	AS 2118.4:2012	Automatic fire sprinkler systems -Sprinkler protection for accommodation buildings not exceeding four storeys in height
NCC 1,3	AS 2118.6:2012	Automatic fire sprinkler systems -Combined sprinkler and hydrant systems in multistorey buildings
NCC 1,3	AS 2419.1:2021	Fire hydrant installations -System design, installation and commissioning
	AS 2419.2:2009	Fire hydrant installations -Fire hydrant valves
NCC 1,3	AS 2441:2005	Installation of fire hose reels
NCC 1,2,3	AS/NZS 3500.0:2021	Plumbing and drainage -Glossary of terms
NCC 3	AS/NZS 3500.1:2021	Plumbing and drainage -Water services
NCC 3	AS/NZS 3500.2:2021	Plumbing and drainage -Sanitary plumbing and drainage
NCC 1,2	AS/NZS 3500.3:2021	Plumbing and drainage -Stormwater drainage
NCC 3	AS/NZS 3500.4:2021	Plumbing and drainage -Heated water services

SUGGESTED STANDARDS FOR OFFICES

NCC 1	AS/NZS 3666.1:2011	Air-handling and water systems of buildings - Microbial control -Design, installation and commissioning
	AS/NZS 3666.2:2011	Air-handling and water systems of buildings - Microbial control - Operation and maintenance
	AS 4118.1.4:1994	Fire sprinkler systems -Components - Valve monitors
	AS/NZS 4645.2:2018	Gas distribution networks -Steel pipe systems
	AS 4809:2017	Copper pipe and fittings - Installation and commissioning
NCC 1,2	AS/NZS 5601.1:2013	Gas installations -General installations
	SA/SNZ HB 32:1995	Control of microbial growth in air-handling and water systems of buildings
	SA TS 5342:2021	Technical specification for building commissioning
	ICANZ:2003	Industry code of practice for the safe use of glass wool and rock wool insulation

10.6 Interior Designers

NCC 1,2	AS/NZS ISO 717.1:2004	Acoustics - Rating of sound insulation in buildings and of building elements -Airborne sound insulation
NCC 1	AS ISO 717.2:2004	Acoustics - Rating of sound insulation in buildings and of building elements -Impact sound insulation
NCC 1,2	AS 1288:2021	Glass in buildings - Selection and installation
NCC 1,2,3	AS 1428.1:2009	Design for access and mobility -General requirements for access - New building work
	AS 1428.1:2021	Design for access and mobility -General requirements for access - New building work
NCC 1,3	AS 1428.2:1992	Design for access and mobility -Enhanced and additional requirements - Buildings and facilities
NCC 1	AS/NZS 1428.4.1:2009	Design for access and mobility -Means to assist the orientation of people with vision impairment - Tactile ground surface indicators
NCC 1	AS/NZS 1680.0:2009	Interior and workplace lighting -Safe movement
	AS/NZS 1680.1:2006	Interior and workplace lighting -General principles and recommendations
	AS/NZS 1680.2.1:2008	Interior and workplace lighting -Specific applications - Circulation spaces and other general areas
	AS/NZS 1680.2.2:2008	Interior and workplace lighting -Specific applications - Office and screen-based tasks
	AS/NZS 1680.2.3:2008	Interior and workplace lighting -Specific applications - Educational and training facilities
	AS/NZS 2208:2023	Safety glazing materials in buildings
	AS/NZS 2270:2006	Plywood and blockboard for interior use
	AS/NZS 2310:2002	Glossary of paint and painting terms
	AS/NZS 2311:2017	Guide to the painting of buildings
	AS 2454:2007	Textile floor coverings - Terminology
	AS/NZS 2589:2017	Gypsum linings - Application and finishing
	AS/NZS 2633:1996	Guide to the specification of colours
	AS 2700:2011	Colour standards for general purposes
	AS/NZS 2785:2020	Suspended ceilings - Design and installation
	AS 2796.1:1999	Timber - Hardwood - Sawn and milled products -Product specification
	AS 3715:2002	Metal finishing - Thermoset powder coating for architectural applications of aluminium and aluminium alloys
	AS 3958.1:2007	Ceramic tiles -Guide to the installation of ceramic tiles
	AS 3958.2:1992	Ceramic tiles -Guide to the selection of a ceramic tiling system
	AS 4288:2003	Soft underlays for textile floor coverings
	AS 4506:2005	Metal finishing - Thermoset powder coatings
	AS/NZS 4668:2000	Glossary of terms used in the glass and glazing industry
	AS 4785.1:2002	Timber - Softwood - Sawn and milled products -Product specification
	AS/NZS 4858:2004	Wet area membranes
	SA HB 197:1999	An introductory guide to the slip resistance of pedestrian surface materials

10.7 Landscape Architects

AS/NZS 1604.1:2021	Preservative-treated wood-based products -Products and treatment
AS 1720.2:2006	Timber structures -Timber properties

SUGGESTED STANDARDS FOR OFFICES

	AS 1725.1:2010	Chain link fabric fencing -Security fences and gates - General requirements
NCC 1,2	AS 1926.1:2012	Swimming pool safety -Safety barriers for swimming pools
NCC 1,2	AS 1926.2:2007	Swimming pool safety -Location of safety barriers for swimming pools
	AS 2303:2018	Tree stock for landscape use
	AS 2304:2019	Water storage tanks for fire protection systems
	AS 2423:2002	Coated steel wire fencing products for terrestrial, aquatic and general use
	AS 3704:2005	Geosynthetics - Glossary of terms
	AS 3743:2003	Potting mixes
	AS 3798:2007	Guidelines on earthworks for commercial and residential developments
	AS 4373:2007	Pruning of amenity trees
	AS 4419:2018	Soils for landscaping and garden use
	AS 4422 (Int):2002	Playground surfacing - Specifications, requirements and test method
	AS 4454:2012	Composts, soil conditioners and mulches
	AS 4685.0:2017	Playground equipment and surfacing -Development, installation, inspection, maintenance and operation
	AS 4970:2009	Protection of trees on development sites

10.8 Mechanical Engineers

	AS 1324.1:2001	Air filters for use in general ventilation and airconditioning -Application, performance and construction
NCC 1	AS 1668.1:2015	The use of ventilation and air conditioning in buildings -Fire and smoke control in buildings
NCC 1,2	AS 1668.2:2012	The use of ventilation and air conditioning in buildings -Mechanical ventilation in buildings
NCC 1	AS 1668.4:2012	The use of ventilation and air conditioning in buildings -Natural ventilation in buildings
	AS 1682.2:2015	Fire, smoke and air dampers -Installation
	AS 1940:2017	The storage and handling of flammable and combustible liquids
	AS 2896:2021	Medical gas systems - Installation and testing of non-flammable medical gas pipeline systems
NCC 1	AS/NZS 3666.1:2011	Air-handling and water systems of buildings - Microbial control -Design, installation and commissioning
	AS/NZS 3666.2:2011	Air-handling and water systems of buildings - Microbial control - Operation and maintenance
	AS/NZS 3666.3:2011	Air-handling and water systems of buildings - Microbial control - Performance-based maintenance of cooling water systems
	AS 4041:2006	Pressure piping
NCC 1,2	AS 4254.1:2021	Ductwork for air-handling systems in buildings -Flexible duct
NCC 1	AS 4254.2:2012	Ductwork for air-handling systems in buildings -Rigid duct
	AS 4809:2017	Copper pipe and fittings - Installation and commissioning
	SA/SNZ HB 32:1995	Control of microbial growth in air-handling and water systems of buildings
	SA TS 5342:2021	Technical specification for building commissioning
	ICANZ:2003	Industry code of practice for the safe use of glass wool and rock wool insulation
	ANSI/ASHRAE STD 111:2008	Measurement, testing, adjusting, and balancing of building HVAC systems

10.9 Structural Engineers

NCC 1,2	AS/NZS 1170.0:2002	Structural design actions -General principles
NCC 1	AS/NZS 1170.1:2002	Structural design actions -Permanent, imposed and other actions
NCC 1,2,3	AS/NZS 1170.2:2021	Structural design actions -Wind actions
NCC 1	AS/NZS 1170.3:2003	Structural design actions -Snow and ice actions
NCC 1,2	AS 1170.4:2007	Structural design actions -Earthquake actions in Australia
	AS/NZS 1554.1:2014	Structural steel welding -Welding of steel structures
	AS/NZS 1554.5:2014	Structural steel welding -Welding of steel structures subject to high levels of fatigue loading
NCC 1,2	AS 1684.2:2021	Residential timber-framed construction -Non-cyclonic areas
NCC 1,2	AS 1684.3:2021	Residential timber-framed construction -Cyclonic areas

SUGGESTED STANDARDS FOR OFFICES

NCC 1,2	AS 1684.4:2010	Residential timber-framed construction -Simplified - Non-cyclonic areas
NCC 1,2	AS 1720.1:2010	Timber structures -Design methods
	AS 1720.2:2006	Timber structures -Timber properties
	AS 1720.3:2016	Timber structures -Design criteria for timber-framed residential buildings
NCC 1,2,3	AS/NZS 1720.4:2019	Timber structures -Fire resistance of timber elements
NCC 1,2	AS 2159:2009	Piling - Design and installation
NCC 1,2,3	AS/NZS 2327:2017	Composite structures - Composite steel-concrete construction in buildings
NCC 1,2	AS 2870:2011	Residential slabs and footings
NCC 1,2,3	AS 3600:2018	Concrete structures
	AS 3610.1:2018	Formwork for concrete -Specifications
NCC 1,2,3	AS 3700:2018	Masonry structures
	AS 3735:2001	Concrete structures retaining liquids
	AS 3850.1:2015	Prefabricated concrete elements -General requirements
	AS 3850.2:2015	Prefabricated concrete elements -Building construction
NCC 1,2,3	AS 4100:2020	Steel structures
NCC 1,2,3	AS/NZS 4600:2018	Cold-formed steel structures
NCC 2	AS 4678:2002	Earth-retaining structures
NCC 2	AS 4773.1:2015	Masonry in small buildings -Design
	AS/NZS 5131:2016	Structural steelwork - Fabrication and erection
	SA HB 71:2011	Reinforced concrete design in accordance with AS 3600-2009
NCC 1,2	NASH-1:2005	NASH Standard Residential and Low-rise Steel Framing - Design criteria
NCC 1,2	NASH-2:2014	NASH Standard Residential and Low-rise Steel Framing -Design solutions

Corporate Information

NATSPEC is the trading name of Construction Information Systems Limited, ABN 20 117 574 606.

NATSPEC, founded in 1975, is a national not-for-profit organisation that is owned by the design, build, construct and property industry through professional associations and government property groups. It is impartial and is not involved in advocacy or policy development. NATSPEC, the National Building Specification, is for all building structures with specialist packages for architects, interior designers, landscape architects, structural engineers, service engineers and domestic owners. AUS-SPEC is the Local Government specification system for the life-cycle management of assets. Packages include Urban and Open Spaces, Roadworks and Bridges, Public Utilities, Maintenance and Rural Roads. NATSPEC is also responsible for the National BIM Guide and its associated documents.

NATSPEC's objective is to improve the construction quality and productivity of the built environment through leadership of information.

STAKEHOLDERS

// Air conditioning and Mechanical Contractors' Association of Australia

// Australian Elevator Association

// Australian Institute of Architects

// Australian Institute of Building

// Australian Institute of Building Surveyors

// Australia Institute of Quantity Surveyors

// Construction Industry Engineering Services Group

// Consult Australia

// Department for Infrastructure and Transport (SA)

// Department of Energy and Public Works (QLD)

// Department of Finance (Federal)

// Department of Finance (WA)

// Department of Infrastructure, Planning and Logistics (NT)

// Department of Treasury and Finance (TAS)

// Department of Treasury and Finance (VIC)

// Engineers Australia

// Major Projects Canberra

// Master Builders Australia

// Public Works Advisory (NSW)

// Standards Australia

CONTACT INFORMATION

Phone 1300 797 142

Fax 1300 797 143

Email mail@natspec.com.au

Web www.natspec.com.au