SPECIFICATION WRITING

WITH NATSPEC 2015

The National Building Specification

SPECIFICATION
WRITING 2015

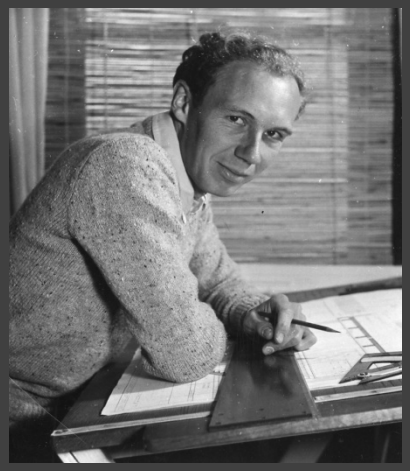
ABOUT NATSPEC

Helping you get what you want.....

" Unfortunately the level of quality that can be policed in the construction stage cannot be higher than that which is spelt out in the contract. If the building contract documents permit a sow's ear, then all the quality control in the world cannot demand a silk purse. "

Bryce Mortlock

NATSPEC founder, 1975



NATSPEC is a national not-for-profit organisation, owned by the industry, whose objective is to improve the quality and productivity of the built environment.

your NATSPEC

WHAT IS A SPECIFICATION?

Written descriptions of materials and construction processes for quality of works, performance, properties and installation required.

Specifications convey design decisions which cannot be expressed in drawings or is more conveniently communicated in words.

It may also include other requirements.....

- test and code requirements
- manufacturer's equipment
- allowances and unit prices

WHAT IS A SPECIFICATION?

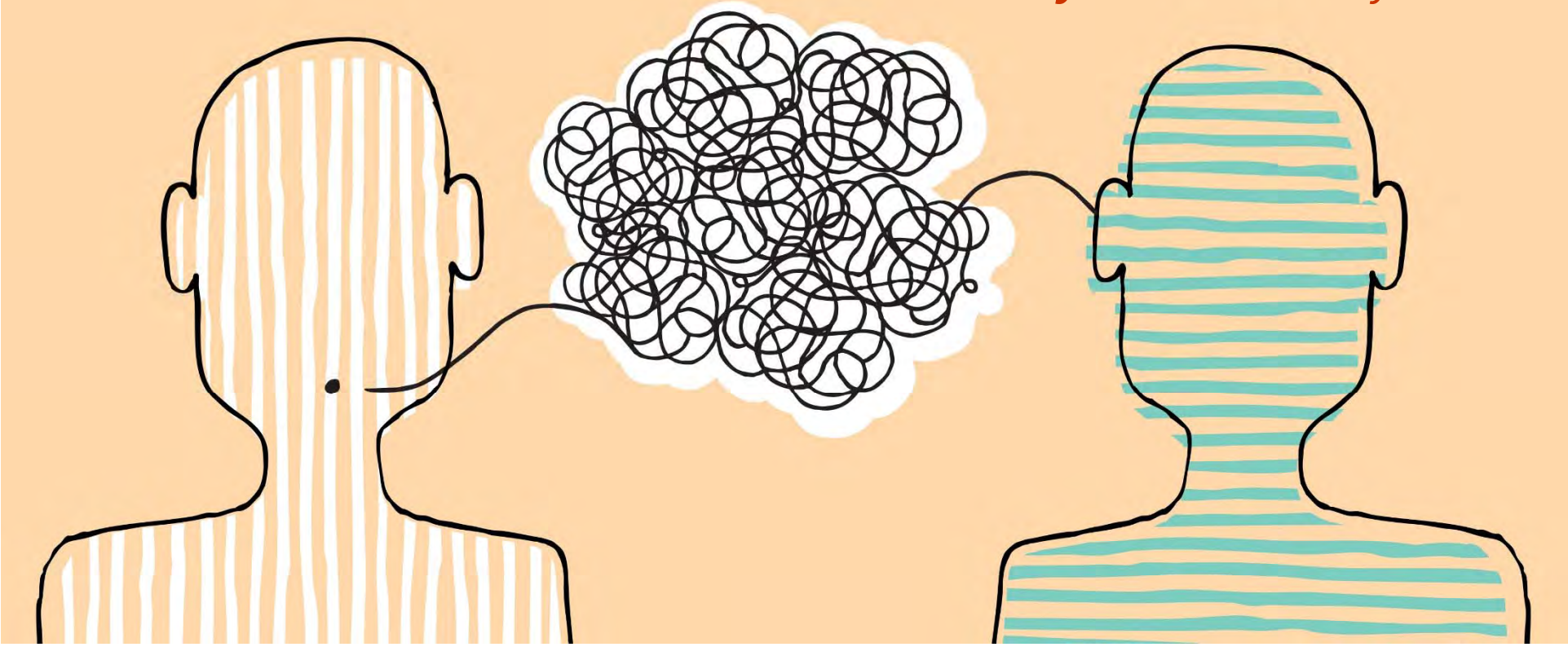
Drawings and specifications are complementary.

Drawings show the form of construction, illustrating extent/quantity of materials and their finished relationship to each other in the project.

Specifications supplement, but should not repeat, information shown on drawings.

WHY HAVE SPECIFICATIONS?

*Specifiers must have the ability to make informed decisions and be able to **communicate** those decisions **effectively** and efficiently.*



WHO USES SPECIFICATIONS?

Multipurpose tool with many users

Used by:

- Clients
- Designers
- Estimators
- Tenderers
- Contractors
- Subcontractors
- Project managers
- Contract administrators
- Legal representatives
- Certifying and supply authorities

  e.g. local councils,

  road and traffic authorities,

  water/sewerage/drainage authority,

  electrical/gas/cable companies
- Other interested parties

  e.g. real estate agents

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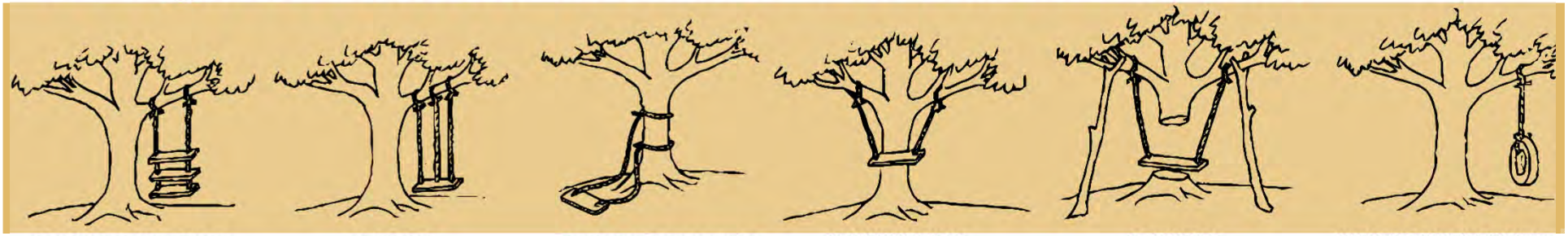
ROLE & FUNCTION

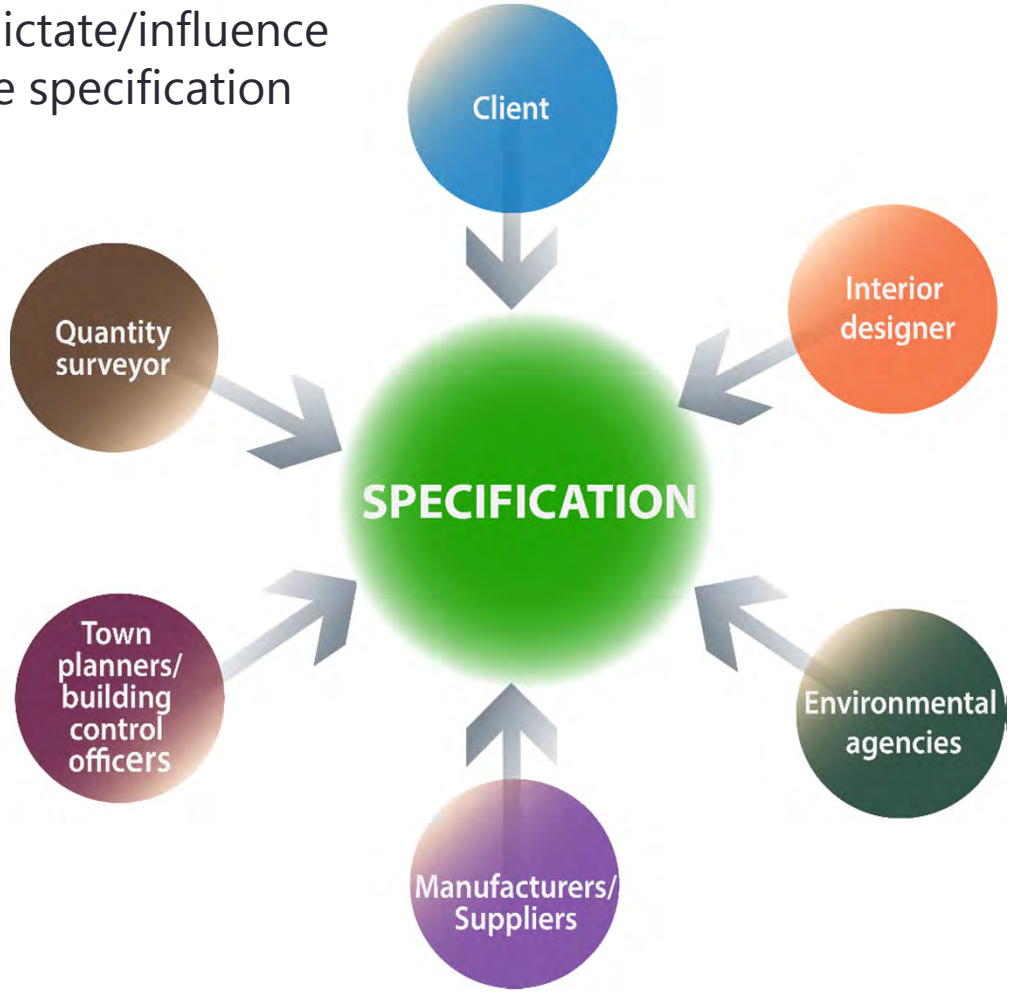
Design document to define what is to be built.



- **Record of design decisions**, materials used and standards sets.
  - To show **statutory** compliance.
    - To be used in **pre-tender estimates**.
    - For **tendering**, by the principal subcontractor and contractor.
- To be part of a contract – **contract document**.
  - **On-site working document** by the contractor and contractor administrator.
- As **evidence** to resolve disputes.
- Information for **facility management** – for maintenance, commissioning, warranties, operations manual, training.

WHO CONTRIBUTES

Parties who may dictate/influence the contents of the specification include:



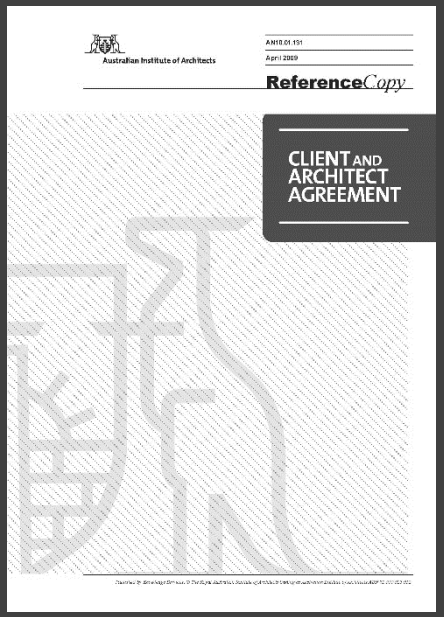
RESPONSIBILITIES

It is a consultant's documentation responsibility to:

A.4 Construction Documentation

Documents

- arrange, attend and record meetings with the client
- coordinate and integrate the work of other specialist consultants
- prepare drawings including plans, elevations and sections, together with other details and schedules to enable statutory approval to construct the project
- prepare specifications in accordance with the drawings and the client's requirements describing the quality of materials, finishes and quality of work necessary to obtain statutory approval
- submit required documents for statutory approval
- prepare further drawings, specifications and schedules to enable the construction of the project
- coordinate the preparation of a pre-tender estimate of the *Cost of Works*



From **CAA-2009**

Core Architectural Services (page 3)

LIABILITY & LITIGATION

Who is responsible?

- For the **Parliament House** in Canberra, the Architects designed fabric covered wall panels to match seating covers in the galleries of both houses.
- The Architects subsequently engaged a specialist consultants to develop a more "precise construction specification".
- As the fabric could not be woven in Australia, a manufacturer in Switzerland was engaged to weave the special wool fabric.
- Before and after opening of the House, there were invasions of Bogong moths. Some months later holes began appearing in the fabric panels in the chambers of the House of Representatives.
- 40 to 50 panels were damaged beyond repair.

The Supreme Court case ruling **found** that:

- The final specification for tender **did not include** requirements for insect or moth-proofing.

  e.g. include conformance to AS 2001.6.1.

- Although Australian manufacturer's will automatically moth-proof fabric, this was not the case in Europe.

It was found that the Architects "were the sole cause of their own misfortune".

ORDER OF PRECEDENCE

Design documents order of precedence:

- Special conditions of contract
- Conditions of contract
- **Specification**
- Drawings
- Others

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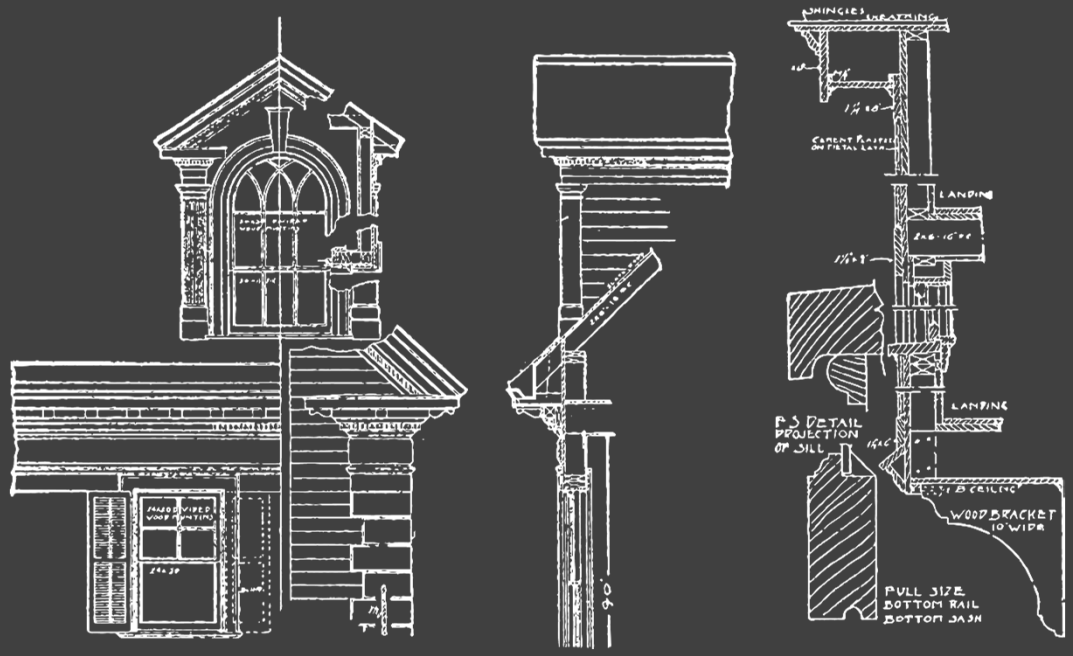
METHODS OF SPECIFYING



descriptive (detail) specification

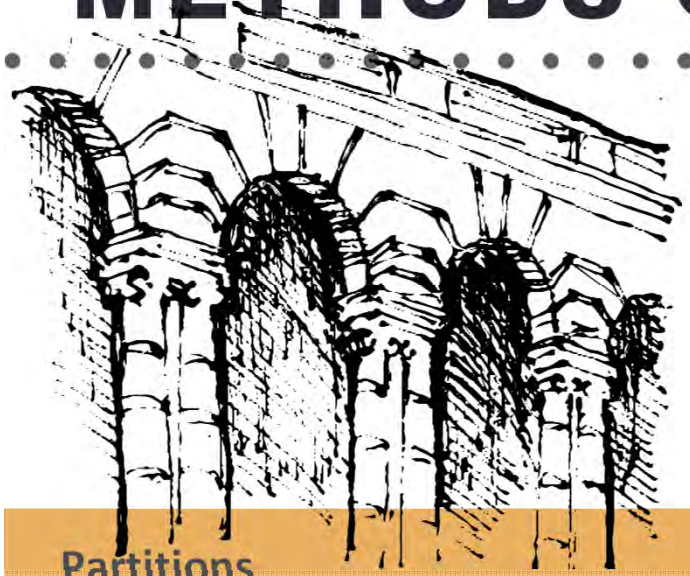
Describes in detail **the exact properties** of the materials, quality of work, and methods required for installing, building or manufacturing/fabricating a component, assembly or building (asset).

Fasteners (for fibre cement corrugated roofing)

Finish: Prefinished exposed fasteners with an oven baked polymer coating to match the roofing material.

Fastenings to timber battens: Provide fastenings just long enough to penetrate the thickness of the batten without piercing the underside.

METHODS OF SPECIFYING



Partitions

Strength and stability: To remain stable, and without rattle and signs of deflection or permanent deformation under normal conditions of use, including the slamming of doors.

Imposed loads: To support imposed dead loads, seismic loads, wind loads, including designated eccentric loads and not to deflect in excess of the following, where H is the height of the partition:

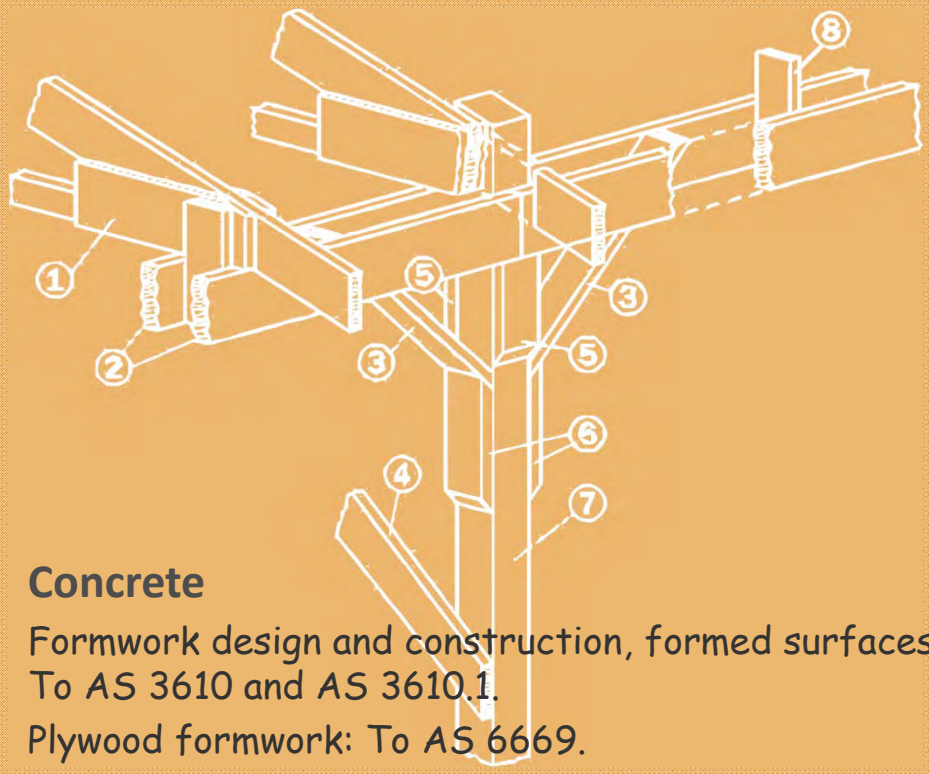
- The lesser of H/240 or 30 mm for partitions subjected to wind loads and lined with flexible material.
- The lesser of H/360 or 20 mm for partitions subjected to wind loads and lined with brittle materials.
- H/500 for eccentric loads.

performance specification

Specifies an item by prescribing a **desired end result**/requirements and the measurable or observable criteria (including testing) by which the result will be judged for acceptability. It includes describing the **function and performance criteria** for an equipment, material, product or building (asset).

It is the most open type of specification.

METHODS OF SPECIFYING



Concrete

Formwork design and construction, formed surfaces: To AS 3610 and AS 3610.1.

Plywood formwork: To AS 6669.

Profiled steel sheeting, including shear connectors: To AS 2327.1.

Specification and supply of concrete: To AS 1379.

Reinforced concrete construction: To AS 3600.

reference

specification

Describes a product, material or equipment by **referencing a published standard**, e.g. AS, AS/NZS, ASTM or BS by title or identification number, which processes and products must comply.

The provisions of the standard become part of the specification.

Also known as compliance specification.

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METHODS OF SPECIFYING

proprietary

specification

Describes a product, material, equipment or assembly by **naming the manufacturer**, brand name, model or type designation.

Monitored lighting system

Data connection: LEGRAND Axiom internal communications units for connecting data cabling or wireless interface to the central monitoring system.

Also known as direct specification.

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PRODUCT PARTNERS

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GROUPING & CLASSIFYING

Classification systems

Classification systems are designed for **organising information,** e.g. in a library for organising books and publications.

Similarly, in a specification it provides **order for quick retrieval** of required information.

Grouping and the National Classification System

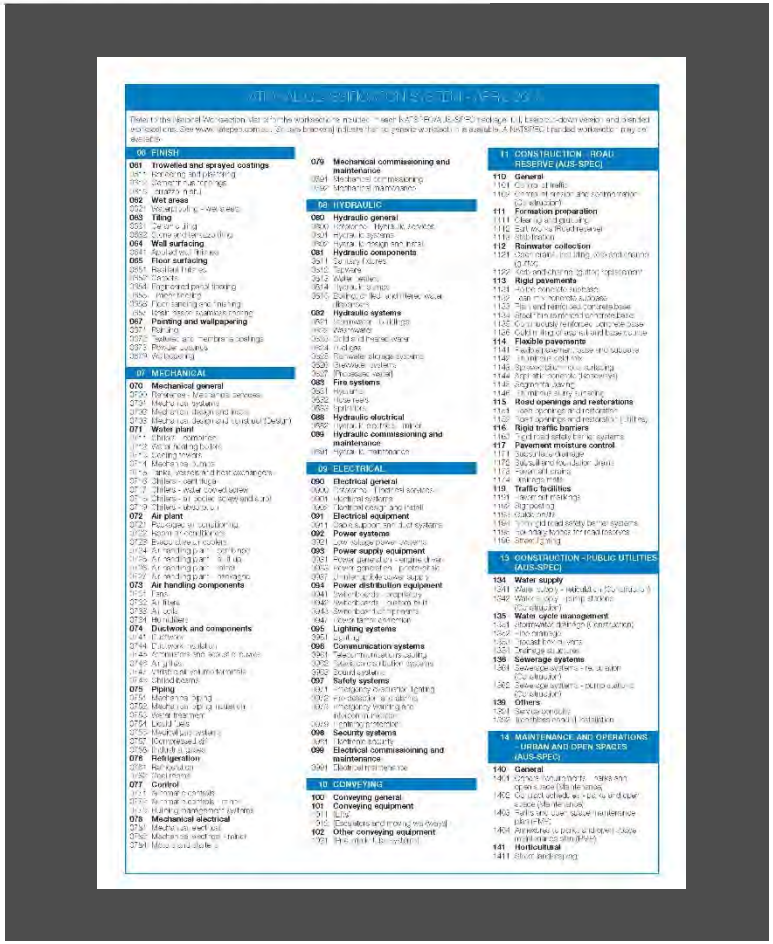
NATSPEC uses the term **worksection** to describe the **foundation unit** of a specification, these are generally grouped according to building elements or construction sequence.

Some worksections are trade based:

e.g. Brick and blockwork

Others are process based:

e.g. Site preparation, Landscape planting



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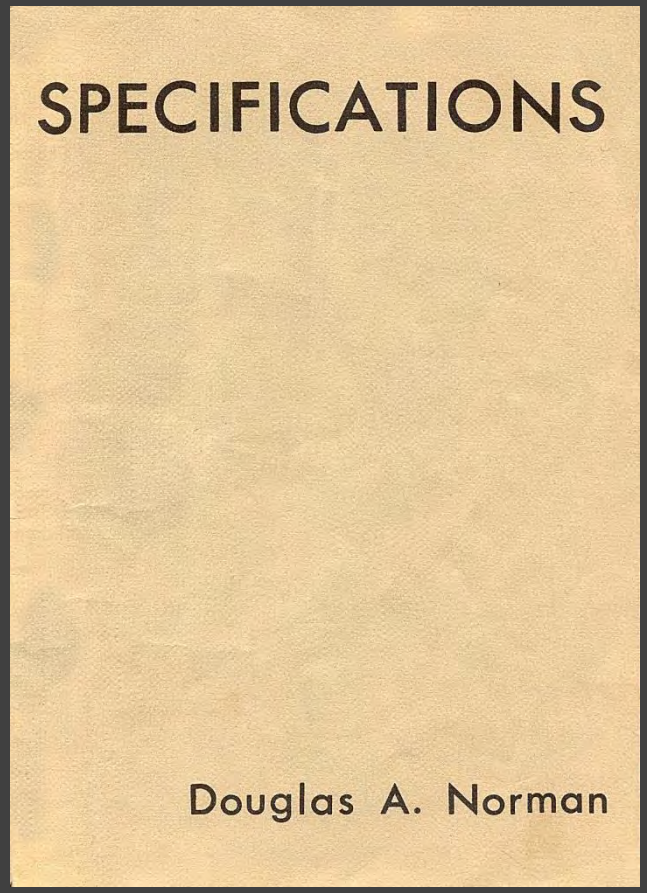
PROJECT SPECIFICATIONS



Compiling project specifications

" The grouping of this material into logical subdivisions is the obvious starting point in the preparation of a specification.....

We also must recognise the best of local contracting and construction techniques and attempt to anticipate the future. "

PROJECT ELEMENTS

Components of a project specification include

- Contract preliminaries
- General requirements
- Some common technical worksections
- Individual or a group of technical worksections
- Any worksections cross referenced by the technical worksections

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PRELIMINARIES

The Technical and Trade sections of the specification deal with the specific matters for each trade in relation to materials, quality and so on. The Preliminaries section of the specification establishes the requirements of the architect and the owner regarding the way in which the contractor will manage the project.

www.acumen.architecture.com
AIA's practice advisory subscription service

The project Preliminaries may include

- Site security arrangements
- Occupancy and adjoining property constraints
- Temporary facilities

e.g. Principal's site office, project signage

- Provisional sums
- Requirements for progress photographs/ records

- Authority requirements
- Survey requirements
- Principal supplied items
- Separate contracts
- Any cost adjustment
- Pest control

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NATSPEC PRELIMINARIES

Workgroup	Subgroup	Worksection
1. General	012 Tendering	0140 Preliminaries – ABIC BW-1
2. Site	013 Generic preliminaries	0141 Preliminaries – ABIC MW-2008
3. Enclosure	014 Contract preliminaries	0142 Preliminaries – ABIC SW-2008
4. Interior	016 Quality assurance	0143 Preliminaries – AS 2124
6. Finish	017 General requirements	0144 Preliminaries – AS 4000
7. Mechanical	018 Common requirements	0145 Preliminaries – AS 4905
8. Hydraulic	019 Sundry installations	0145 Preliminaries – AS 4902
9. Electrical		0148 Preliminaries – ABIC EW-1

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GENERAL REQUIREMENTS

This worksection draws together administrative requirements which is common to all technical worksections.

The worksection may cover

- Referenced documents
- Interpretation
- Inspections and tests
- Samples
- Contractor's submissions
- Materials and components
- Installation
- Marking and labelling
- Completion
- Access for maintenance

Other project specific requirements the worksection may cover include acceptable forms of warranty, notice required for inspections, and acceptable testing authorities.

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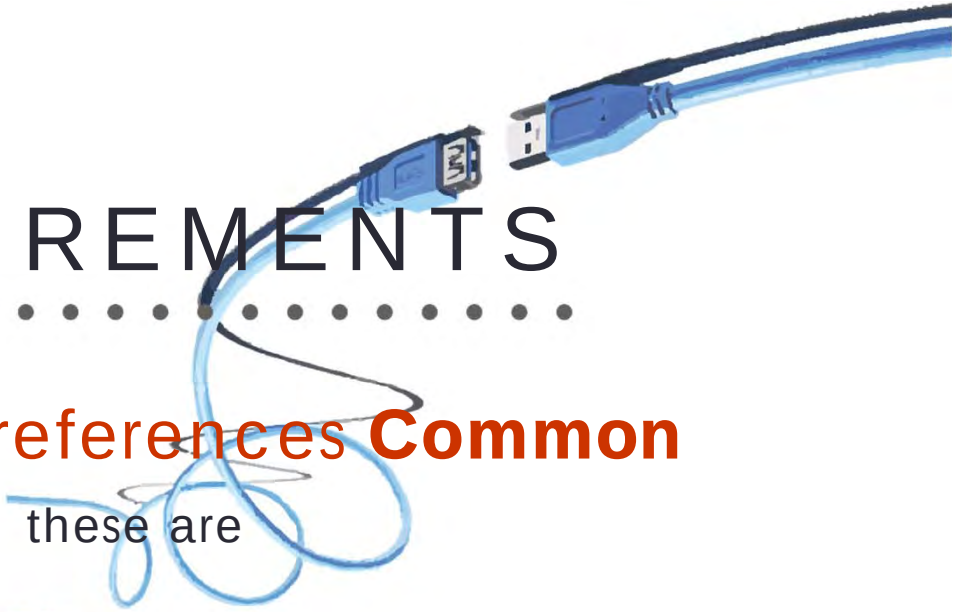
COMMON REQUIREMENTS



The **General requirements** references **Common requirements** worksections, these are

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

*Exclude worksections not required and delete from the cross reference list in the **General requirements** worksection.*

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SPECIFYING STANDARDS

" Nothing could be more necessary, more logical, more timely or more useful in today's building industry or more responsive to the call for quality control than a specification system tied to relevant Australian standards. "

RAIA Report, Practice Division, August 1989

" NATSPEC provides a checklist of possible relevant standards. It also provides means of exercising options contained in standards. It also allows for manufacturer's recommendations to be referenced or "called up" in the same way as standards. "

RAIA Report, Practice Division, August 1989

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CHOICES IN STANDARDS

Specifiers and project specific requirements

4.4 LINING

Sheet lining schedule

Property	P1	P2	P3
Material			
Grade/type			
Lining system			
Level of finish			
Thickness (mm)			
Configuration			
Edge type			
Joint type			
Fixing			
Cornice			

Level of finish: To AS/NZS 2589.

- Level 3: For concealed surfaces.
- Level 4: Default level for plasterboard lining unless specified otherwise.
- Level 5: For gloss or semi-gloss paint finish under critical lighting conditions.

If choices are included in a standard, the specifier may need to select the option relevant to the project.

From the **Partitions – framed and lined** worksection.

AS/NZS 2589:2007
Gypsum plasterboard

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CHOICES IN STANDARDS

Specifiers and project specific requirements

Corrosion resistance

Atmospheric corrosivity category: To the *General requirements* worksection.

The **Corrosion-resistance table** contains default values based on the AS/NZS 2312 series. BCA Volume 2 also has specific values for domestic sheet roofing in four environmental corrosivity categories which are aligned with AS 4312. Edit the table to suit the project and coordinate with other worksections. The internal and external project corrosivity categories are nominated in the *General requirements* worksection from the following categories: C1 (very low), C2 (low), C3 (medium), C4 (high), C5 (very high) and T (inland tropical). These are described in AS 4312. The C5 categories, C5-I (industrial) and C5-M (marine), are not addressed in this table. For categories not covered in the table, consider corrosion protection requirements in more detail. See the various parts of AS/NZS 2699 where there are duplex protective coatings systems in addition to those given here. If internal elements are being painted, lower levels of zinc-coating may be considered. See also AS 3700 for corrosion resistance ratings.

For further information refer to NATSPEC TECHnote DES 010 on atmospheric corrosivity categories for ferrous products.

Steel products: Conform to the **Corrosion-resistance table** or provide proprietary products with metallic and/or organic coatings of equivalent corrosion-resistance.

Corrosion-resistance table

Atmospheric corrosivity category to AS 4312	Threaded fasteners and anchors		Powder actuated fasteners
	Material	Minimum local metallic coating thickness (µm)	Material
C1 and C2	Electroplated zinc or Hot-dip galvanized	30	Stainless steel 316
C3	Hot-dip galvanized	50	Stainless steel 316
C4 and T	Stainless steel 316	-	Stainless steel 316

For self-drilling screws in severe marine environments, indoor swimming pools or buildings with corrosive industrial processes, consult the roofing/cladding manufacturer on the requirements for shank corrosion protection.

Select the correct category for the project.

From the **Adhesives, sealants and fasteners** worksection.

AS 4312-2008 Atmospheric corrosivity zones in Australia

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CHOICES IN STANDARDS

Specifiers and project specific requirements

1.2 PERFORMANCE

Ambient climatic conditions

Design rainfall intensity (mm/h) to AS/NZS 3500.3: [complete/delete]

See AS/NZS 3500.3 Table E1 or refer to the Hydrometeorological Advisory Services of the Bureau of Meteorology (HASBM). SAA/SNZ HB 114 provides worked examples of roof drainage calculations. The BCA cites AS/NZS 3500.3:2003.

From the **Roofing – combined** worksection.

AS/NZS 3500:2015
Plumbing and drainage – Stormwater drainage

Include correct rainfall intensity for the project site and complete the *Prompt*.

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STANDARDS CITATION

Do not use umbrella clauses

" All work and materials are to comply with the BCA and all relevant Australian Codes and Australian Standards. "

Use **meaningful** citations which can provide clarity in event of disputes.

Evaluate a standard's scope and currency

A standard is a published document which sets out specifications and procedures designed so that a material, product, method or service is fit for its purpose and consistently performs the way it was intended.
A citation is only **meaningful** if it is specific to the requirement. This may require referring to a specific clause of a standard.

e.g. for reinforcement in Brick and blockwork construction:

Corrosion protection: To AS 3700 clause 5.9.

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STANDARDS CURRENCY

AS/NZS 2280:2014 Ductile iron pipes and fittings. ($159.08 Personal pdf)
This standard supersedes the 2012 edition. It specifies requirements for ductile iron pressure pipes centrifugally cast in moulds, and ductile iron fittings of nominal sizes up to and including DN 750.
Referenced worksections:
0071 *Water supply – reticulation and pump stations (Design)*: 3.3 Products and materials;
0076 *Sewerage systems – reticulation (Design)*: 3.7 Materials;
0161 *Quality (Construction) (AUS-SPEC)*: 4.3 Annexure C - Maximum lot sizes and minimum test frequencies;
1341 *Water – reticulation (Construction)*: 3.2 Pipes and fittings;
1361 *Sewerage systems – reticulation (Construction)*: 3.2 Pipes and fittings.

Printed (NM – UP 19.02.15)

AS/NZS 2312 Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings.
This standard is superseded by AS/NZS 2312 Parts 1 and 2:2014.
Part 1:2014 Paint coatings. ($205.36)
This standard supersedes AS/NZS 2312:2002. It provides guidelines for the selection and specification of paint coating systems for the protection of structural steel work against atmospheric corrosion.
Part 2:2014 Hot dip galvanizing. ($132.33)
This standard supersedes AS/NZS 2312:2002. It provides guidelines and recommendations regarding general principles of design, appropriate for articles to be hot dip galvanised for corrosion protection.
Relevant worksections: 0171 *General* requirements, 0181 *Adhesives, sealants and fasteners*, 0310 *Concrete - combined*, 0311 *Concrete formwork*, 0313 *Concrete post-tensioned*, 0316 *Precast concrete*, 0317 *Tilt-up concrete*, 0341 *Structural steel*, 0343 *Tensioned membrane structures*, 0344 *Steel – hot-dip galvanized coatings*, 0345 *Steel – protective paint coatings*, 0511 *Lining*, 0531 *Suspended ceilings - combined*, 0532 *Suspended ceilings – flush lined*, 0533 *Suspended ceilings – ceiling units*, 0611 *Rendering and plastering*, 0671 *Painting*, 0673 *Powder coatings*, 0679 *Wallpapering*, 0711 *Chillers - combined*, 0713 *Cooling towers*, 0718 *Chillers – air cooled screw and scroll*, 0741 *Ductwork*, 0761 *Refrigeration.*

Printed (KR – UP 28.01.15)

Checking updated standards

NATSPEC checks a standard's currency every update. If a standard is updated, its effect on the relevant worksections are evaluated. Specifiers need to do the same for their projects.

This includes amendments to the standards.

In event of litigation, the specifier is considered responsible for citing current and not superseded standards.

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ADVICE FOR SPECIFIERS

brevity

- Use the **imperative** form.

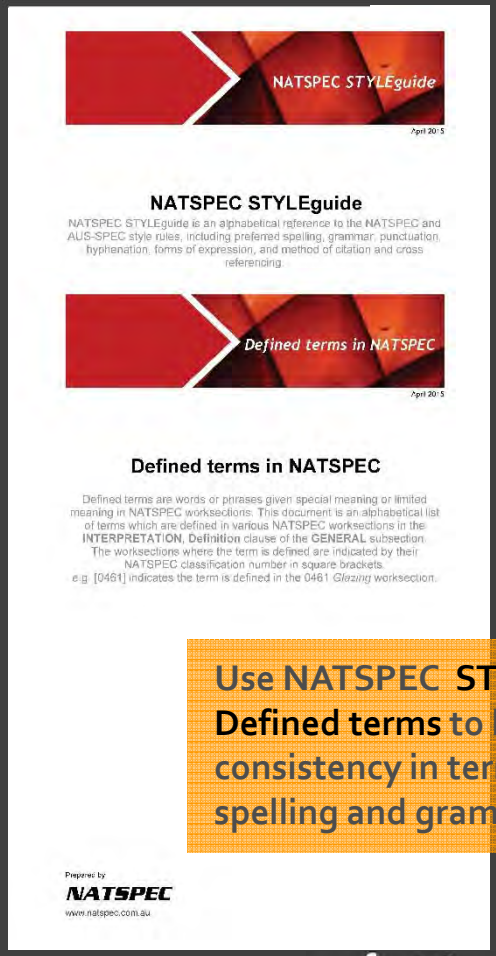
  e.g. ***Lay tiles****… rather than…. Tiles shall be laid*

- Avoid lengthy verbal descriptions – use **NATSPEC style** (e.g. colons and keywords), draw it or schedule it instead.

  e.g. Nailing: 150 mm centres to bearers at maximum 450 mm centres.

clarity

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



Use NATSPEC **STYLEguide** and **Defined terms** to help provide consistency in terminology, spelling and grammar.

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ADVICE FOR SPECIFIERS

content

- Develop an **office policy** for what materials will be included in the drawings, schedules and written specifications.
- **Do not include** material in technical worksections which should be covered in preliminaries, general annexures or the general conditions of themselves.

  e.g. tendering, contractual material, project descriptions, drawing lists.

cross references

- **Do not** use phrases such as detailed on drawings or unless specified otherwise.

consultants

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

compliance

- Establish if any **alternative solutions** are to be pursued.
- Consider preparing a **NCC compliance** document.

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ADVICE FOR SPECIFIERS

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 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 specification and between specification, drawings and other contract documents.

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 Conditions of Contract and check for items requiring early attention.

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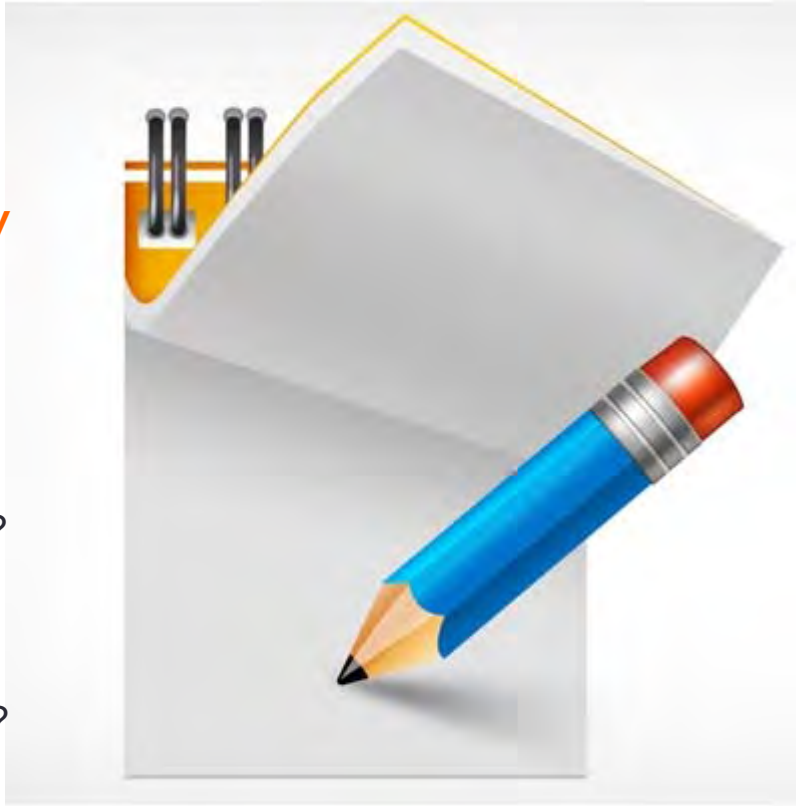
A GOOD SPECIFICATION

??? Ask yourself.....

- Does it address the client's **brief**?
- Does it address the NCC and other **statutory** requirements?
- Is it consistent with the method of **procurement**?
- Does it cover all **project elements**?
- Is the **structure** logical and easy to navigate?
- Does it **fit** with the drawings, schedules and contract?
- Does it address all **users** of the specification?
- Has it been **proofed**?
- How will it be **used** on site?



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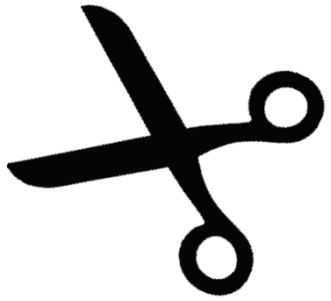
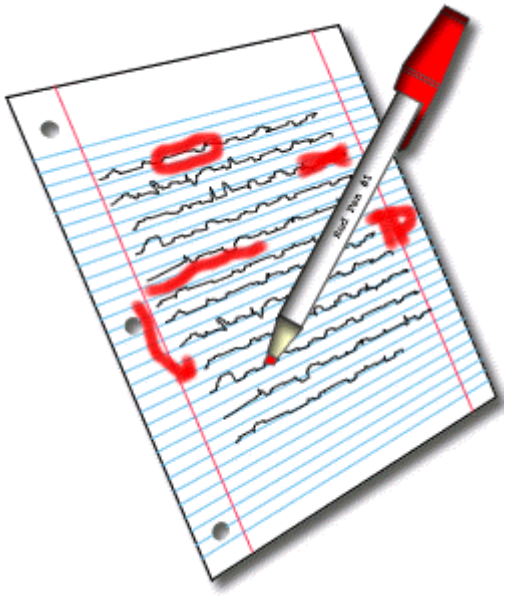
NATSPEC AS A MASTER



" The measure of the efficiency of a master specification is the extent to which it presents a complete reference for project specification. No master can be expected to contain 100% of every project's technical requirements, but with intelligent feedback, it will gradually get closer to the ideal. "

Douglas Norman

NATSPEC is a National Master Specification



As a master specification it will not contain all the technical requirements for every project. For each project, the specifier will need to:

- **Select** the appropriate NATSPEC worksection and **edit** the material to suit the project.
- **Delete** material which is not appropriate.
- Where **prompts** and **schedules** are provided, include options or delete if not relevant.
- **Add** new material required for the project if not included by NATSPEC.

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FURTHER READING

References and further reading.....

If further information is required on specification writing:

- Study other organisation's specifications.
- Be mentored by an experienced specification writer.
- Read books on the subject:

Gelder, John (2001)
Specifying architecture

Norman, Douglas A. (1977)
Specifications

Peaslee, Horace W (1939)
Streamlined specifications

Standen, David (1995)
Construction industry specifications

SPECIFICATION
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STAKEHOLDERS

Industry

- Air Conditioning and Mechanical Contractors' Association of Australia
- Australian Council of Built Environment Design Professions
- Australian Elevator Association
- Australian Institute of Architects
- Australian Institute of Building
- Australian Institute of Building Surveyors
- Australian Institute of Quantity Surveyors
- Construction Industry Engineering Services Group
- Consult Australia
- Engineers Australia
- Master Builders Australia
- Standards Australia

Government

- Chief Minister, Treasury and Economic Development Directorate (ACT)
- Department of Finance (Federal)
- Department of Finance (WA)
- Department of Housing and Public Works (QLD)
- Department of Infrastructure (NT)
- Department of Planning, Transport and Infrastructure (SA)
- Department of Treasury and Finance (TAS)
- Department of Treasury and Finance (VIC)
- Office of Finance and Services (NSW)

SPECIFICATION
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NATSPEC'S ROLE

The NATSPEC team continually updates.....

NATSPEC is a **system (of worksections)** which can be used for the production of accurate, complete and well-written specifications. The system is continually **updated** by the team to **reflect** any **changes in the industry** practice **and standards**.

An example:

Specifying Trees - a guide to assessment of tree quality (a NATSPEC publication) was used as a base document in the ***Landscape – plant procurement*** worksection. This publication has now been adopted as an Australian Standard – **AS 2303:2015 Tree stock for landscape use**. This worksection will be updated in the October 2015 to reflect this.

Reviewed by the industry.....

Changes to the system are issued for **external review** by subscribers, consultants, government agencies, manufacturers and other industry agencies.

SPECIFICATION
WRITING 2015

THE SPECIFIER'S ROLE

" NATSPEC is commonly but erroneously regarded as yet another standard specification for building works. There is a wide belief that that is all there is to NATSPEC.....it would be a mistake to regard NATSPEC as a "standard specification with universal status is all respects. "

RAIA Report, Practice Division, August 1989

The Specifier links the system to the project.....

It is the specifier's role to **customise** the **NATSPEC system** (of worksections) to suit their project.

your NATSPEC