

AUS-SPEC – AN OVERVIEW

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Summary

In 2007 IPWEA and Standards Australia engaged NATSPEC to update, develop and distribute AUS-SPEC, the Local Government Specification covering minor civil works. NATSPEC is a not-for-profit organization owned by 21 stakeholders with each state, territory and federal government represented. NATSPEC's major service is providing a national master specification to the construction industry.

The new partnership between IPWEA and NATSPEC has been built on NATSPEC's 30 year history and specialised expertise in the specification field. The 2007 release restructured AUS-SPEC into the national classification system. Specifications can now be compiled more quickly and easily using a NATSPEC developed software program called SPECbuilder Pro. NATSPEC *Basic* and *Site* packages have been added to strengthen AUS-SPEC.

Introduction

AUS-SPEC has been in use for more than 10 years and many major projects have been built using this specification system. NATSPEC has aligned AUS-SPEC with the national classification system and has introduced SPECbuilder Pro for easy compilation of specifications. NATSPEC is a not-for-profit organisation set up in 1975 to provide assurance of a baseline level of quality by providing a national master specification system to the construction industry.

National master specification system

National master specifications such as NATSPEC and AUS-SPEC are desirable and economical because it is not feasible for each professional practice or local council to monitor all the changes in regulations, and standards and in product/technology improvement. Rather than each council developing their own material and 'reinventing the wheel', AUS-SPEC represents the collective experience of all subscribers and other industry contributors. Further, there are huge efficiency gains when the national master specification is commonly used. In Australia, it is appropriate that there be a national system because the construction industry is national with common

materials, construction techniques and procurement strategies.

The International Construction Information Society (ICIS) is an association of organizations that provide national master specification systems. Countries represented include Australia, Belgium, Canada, Czech Republic, Finland, Germany, Japan, Netherlands, New Zealand, Norway, South Africa, Switzerland, UK and USA. It exists because it is internationally recognized that national master specifications add value to their nations as a whole and that in the long-term there is value in moving towards international harmonisation. NATSPEC is a member of ICIS and meets with member organizations on a regular basis.

Need for specifications

It is the documentation phase of construction procurement that ensures ultimate success or failure in the transformation of design to reality. Documentation involves the production of drawings, schedules and specifications, which form part of the contract documents of each project. A succinct and unambiguous specification is a prerequisite for a quality outcome.

The primary function of the drawings and specification is to give effect to design

decisions. Many design decisions cannot be expressed in graphic form and therefore rely on words. Other decisions may be too tedious or impractical to be conveyed in graphic form. The specification links the drawings with the general conditions of contract. It does not duplicate information in the drawings and general conditions, but rather, complements them. Drawings contain the graphical descriptions, primarily defining components, material, quantity and position and sometimes quality.

Specifications are written descriptions, primarily defining quality and conveying the processes that express the designer's intentions. As a general principle:

Drawings + schedules = Quantity
 Specifications = Quality

Roles of a specification

The specification has many roles including being:

- A document demonstrating compliance with statutory requirements.
- A written record of design decisions taken.
- An estimating document.
- A tendering document.
- A legal (contractual) document.
- A project management tool.
- An on-site working document.
- A dispute settlement document.
- A facilities management document.

Quality

Quality is a subjective matter meaning different things to different people depending on perceived priorities. People's ability and willingness to pay for a particular level of quality is also varied.

A quality specification must clearly demonstrate compliance with legislation and the requirements of relevant authorities. AUS-SPEC identifies these issues and now offers guidance to the writer for implementation. The level of quality set by legislation is built upon by the incorporation of Australian Standards and feedback from industry. A Royal Australian Institute of Architects report by the late Bryce Mortlock, the founder of NATSPEC noted:

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.¹
 This is still true today.

Consequences of poor quality in documentation

There is growing concern on the issue of quality within the industry in Australia as highlighted by a number of recent articles commenting on the link between poor documentation and the consequent effects on projects.

The problem

The CSIRO noted:

From a contractors' perspective, the deficiencies occurring in design and documentation being provided by consultants, have been steadily increasing over the past 12-15 years and are causing corresponding increases in the extent of inefficiency within the construction process. As a consequence, decreases in project quality and increases in overall project costs result. Of major concern are the additional costs – which to a large degree end up being absorbed by contractors – caused by the delays and disruption in trying to clarify inadequate, impractical, conflicting or ambiguous design and specification documentation.²

An ACIF (Australian Construction Industry Forum) media release following the Forum notes:

Extensive case study research presented at the Construction Forum highlighted that poor design and documentation leads to: major cost over-runs; re-work and extensions of time; high stress levels; loss of morale, and reduced output; adversarial and unethical behaviour; and declining safety standards.³

¹ RAI A Practice division report, NATSPEC, August 1989.

² A Survey investigating changes in Design and Documentation Quality within the Australian Construction Industry and its effect on Construction Process Efficiency, CSIRO, 2000.

³ ACIF media release, 11 May 2004

Towards a solution

The CSIRO noted in their 2000 survey report that improvement in construction efficiency would result from creating awareness of the benefits of quality design and documentation. *Improvements in construction process efficiency will result from creating an awareness of the value of quality design and documentation...The benefits would be more projects being completed on time, within budget and with a reduced likelihood of legal action due to contractual disputes. Also, with less RFIs, variations and rework, contractors would be able to minimise the management time and cost spent on non-value adding activities. These benefits would be reflected in reduced project and contractual risk, and a higher level of profitability for both clients and contractors.*⁴

AUS-SPEC Benefits

AUS-SPEC is a specification system. It is not a project specification. It provides a point of reference for good construction practice. It is not an Australian Standard or a governmental regulation. No one is compelled to adopt AUS-SPEC but many in the industry believe that it is in the industry's best interest to do so.

The benefits of using AUS-SPEC as a required document are:

- It reduces uncertainty by providing a predictable structure with consistent content.
- It provides a clear, simple and common language between all the parties, professional consultants and contractors during the design, construction and maintenance process.
- Its material is current, thereby facilitating the preparation of quality specifications saving time, heartache, confusion, frustration, money, and, occasionally court proceedings.
- It reflects current practice in the industry in Australia.

- It is economical. It 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.
- It is part of a coordinated specification system that covers the whole of the project, not just part of it.
- It is easy and efficient to use with the specification compiler SPECbuilder Pro and the facility for office-edited worksections and branded worksections.
- It is aimed at producing a quality built result at a competitive price.

Clients prefer NATSPEC specifications because they provide assurance of a baseline level of project quality. This is now applicable to AUS-SPEC.

Key Improvements to AUS-SPEC

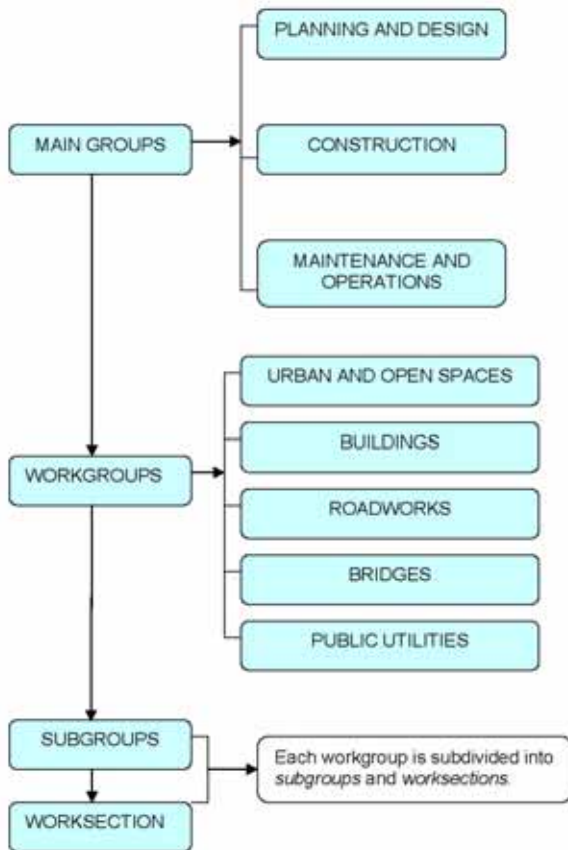
A National Classification system

AUS-SPEC worksections are now classified and sequenced in a logical order, which corresponds to the Australian construction industry sequence and type of works.

The classification system provides a consistency of structure. Benefits of a classification system are:

- Readers know where to find the required information. Writers know where to find existing worksections and where to put new.
- Builders can confidently break up specifications, including all relevant parts in a work package, because the classification system means that worksections are consistently located.
- Head and sub-consultants can easily locate the worksections thereby avoiding duplication or omission.
- Contractors can potentially reduce margins because the predictability of the classification system makes for less uncertainty.

⁴ A Survey investigating changes in Design and Documentation Quality within the Australian Construction Industry and its effect on Construction Process Efficiency, CSIRO, 2000.



SPECbuilder Pro is a Windows based specification compilation software program to increase efficiency and accuracy. It enables subscribers to:

- Create new specifications using NATSPEC and AUS-SPEC office-edited worksections.
- Edit, merge and set styles for specification documents.
- Organise and add existing project specifications to the Project list.
- Add project specific information to specifications.

Updating Service

The regular development and updating of the specification system responds to user and industry feedback. NATSPEC brings its aim of providing easier and more efficient specifications to document quality projects to AUS-SPEC. The number of regulations that change each year continues to increase. NATSPEC provides the economies of scale to track changes and to keep consultants up-to-date. The end result is better documentation that gives clients a more reliable basis for assessing tenders and construction.

Maintenance

One of the principal advantages of a national specification system like AUS-SPEC is that it draws on a wide range of people and organizations. Internally NATSPEC uses a team of editors with specialist expertise in different disciplines required for a project. Where appropriate, NATSPEC engages outside specialists to draft material. NATSPEC submits all new or significantly revised worksections for external review to relevant stakeholders including specifiers, suppliers, contractors and client organizations. The response from these outside reviews is incorporated and ensures continuing relevance.

Review Process

The review process takes into account advances in material development, construction efficiency and ability, and cost.

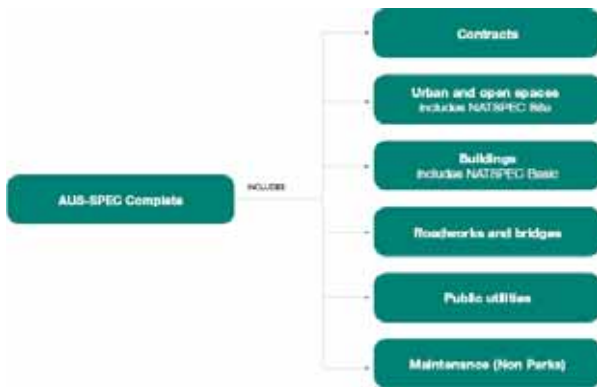
Keeping AUS-SPEC current is a paramount NATSPEC obligation. The evolution of specifications relies on many sources including:

- Amendments to regulations and Standards.
- Subscriber/user feedback.
- Stakeholder feedback.
- Collaboration with global master specification providers.
- Editorial team experience, knowledge and input.
- External reviews.

By these means NATSPEC accumulates and maintains quality information. The result is quality practice within realistic cost constraints.

Subscription Service

Previously AUS-SPEC was sold as an expensive package with limited updating and development. AUS-SPEC is now provided with an annual updating service at less than one-tenth of the original package cost. Subscribers can select from the following AUS-SPEC packages to best suit their projects:



AUS-SPEC Complete covers planning and design, tendering, contract preliminaries, construction, maintenance and operations of open and urban spaces, buildings, roadworks, minor bridges for vehicle and pedestrian use, and public utilities. This package satisfies most local councils' needs and is used by the design, maintenance and operational personnel.

AUS-SPEC Contracts covers tendering, contract preliminaries, quality checklists and quality requirements for supply-projects and supply-period supply and services. It includes sample documents which provide guidelines for completing the tender and contract documentation, maintenance management plans and contract schedules for a maintenance contract. This package is for Contract, Supply, Asset and Works Managers, Purchasing and Legal Officers.

AUS-SPEC Urban and open spaces covers planning and design, tendering and contract preliminaries, construction, maintenance and operations of urban and open spaces (landscaping, pathways and retaining walls). It introduces the concepts of Park Maintenance Plan (PMP) to organize and ensure quality maintenance and Activity Contract Requirements (ACR) covering horticultural and built items, cleaning operations and miscellaneous activities such as storm damage response. It also includes the NATSPEC *Building Site* package for site preparation works and all works external to the building but within the site boundary together with mechanical, hydraulic and electrical services design and installation work. This package is for Environmental Services, Recreation and Maintenance Managers and Park Superintendents.

AUS-SPEC Buildings covers planning, design, tendering and contract preliminaries, maintenance and operation of buildings and its associated services. A Building and Facilities Maintenance Plan (BFMP) is introduced to ensure better coordination of quality management and performance requirements covering security, emergency call out, storm damage response and cleaning. It also includes the NATSPEC *Building Basic* package for simple building projects where brevity is a priority. It covers site, structural, architectural, interiors, landscaping and mechanical, hydraulic and electrical services design and installation work. This package is for Building, Asset, Property Services and Engineering Services Managers.

AUS-SPEC Roadworks and bridges covers planning and design, tendering and contract preliminaries, construction, maintenance and operations of roadworks and minor bridges for vehicle and pedestrian use. It introduces the concepts of Maintenance Management Plan (MMP) to organize and ensure quality maintenance processes and Activity Contract Requirements (ACR) covering road pavement and shoulder, drainage, roadside, traffic facilities and miscellaneous activities such as emergency call out. This package is for Design and Development, Contracts, Asset, Maintenance Business Unit and Strategic Planning Managers.

AUS-SPEC Public utilities covers planning and design, tendering and contract preliminaries, construction, maintenance and operations of public utilities (water supply, water cycle management, sewerage systems and cleaning and waste management). It introduces the concepts of Maintenance Management Plan (MMP) to organize and ensure quality maintenance and Activity Contract Requirement (ACR) for various activities. This package is for Engineering Services, Environmental Services and Maintenance Managers.

AUS-SPEC Maintenance (Non Parks) covers tendering and contract preliminaries, maintenance and operations buildings, roadworks, minor bridges for vehicle and pedestrian use and public utilities. It introduces the concepts of Maintenance

Management Plan (MMP) to organize and ensure quality maintenance and Activity Contract Requirements (ACR) for various activities. This package is for Engineering Services, Environmental Services, Asset and Maintenance Managers.

Appropriate *AUS-SPEC TECHguides* are included as part of each package.

Additional publications provided with AUS-SPEC

QUICKstart: A brief guide to the installation and use of NATSPEC and AUS-SPEC packages and SPECbuilder Pro. It lists the abstracts of the *TECHguides* and the integration of AUS-SPEC into the National classification system.

National worksection matrix: A matrix that may be used to check or select the appropriate NATSPEC and AUS-SPEC specification package. It also lists the number of worksections included as part of each package.

TECHguides: Provide roadmaps and examples for compiling the documentation required for local government projects. They include information on contracts, technical specifications and tender submission requirements. They should be read prior to commencing a project. They are included in the reference documents section of SPECbuilder Pro in pdf format and can be printed as required.

NATSource: A listing of all sources of citations in NATSPEC and AUS-SPEC worksections. This is updated and issued annually.

SPECnotes: A quarterly newsletter produced for NATSPEC and AUS-SPEC subscribers to explain and describe NATSPEC content, revisions and proposals as well as administrative and subscription matters. It includes reviews of relevant new Australian standards and code updates as well as providing key industry information.

Standards revising NATSPEC: A cumulative listing of all new and revised standards over the year which relate to NATSPEC worksections. It is updated on a monthly

basis and made available to subscribers on the NATSPEC website.

TECHnotes: A one page technical summary note prepared by NATSPEC giving general information on specification writing or technical topics relating to more than one worksection. They are also used by the NSW RIAA for their Continuing Education program and, other organizations including, Engineers Australia, Australian Institute of Quantity Surveyors, Australian Institute of Building and the Building Designers Association of Victoria etc.

Specifying ESD TECHreport: This *TECHreport* outlines the principles of Ecologically Sustainable Development (ESD) and their application to building specifications. ESD-related items included in NATSPEC worksections are listed and cross referenced to BCA, NABERS and Green Star requirements.

Comparison table: A comparison of the old AUS-SPEC specification numbers and activity titles with the new specification numbers and their location in new packages. The document is available on <http://www.natspec.com.au/AUS-SPEC>

Future challenges

Effect of climate change on infrastructure

Climate change is real and underway and will continue in the 21st century. According to the CSIRO report on Climate change, the prospective impact on the built environment due to climate change in Australia could be:

Buildings

- More fire and storm damage.
- Implications for building design and insurance in high risk areas.

Transport

- Road maintenance costs up by 30% by 2100.
- Inundation of road, rail and airport systems.

Water

- Inadequate stormwater capacity during floods.

Energy

- Increased peak demand for air conditioning – possible black-outs.

- Reduced demand for heating.
- Reduced water supply for coal-fired power stations.

Emergency services

- Greater demand due to more extreme weather conditions.

Potential areas of action

Analysis and revision of planning systems including revision and development of codes, standards and guides to increase resilience in climate change, environment, resulting from:

- The Australian Building Codes Board considering climate change as part of their periodic reviews.
- Review of standards used for building, plumbing and electrical work and of specification for the development and subdivision of land. This includes a particular focus on standards related to buildings and utilities.
- Review of information used to determine vulnerability of settled land to climate-related hazards (floods, bushfires, cyclones and coastal inundation) and develop new or revised risk management guidance to take into account any projected changes as a result of climate change.
- Revision of stormwater and sewerage guidelines.

Conclusion

A well maintained purpose-built technical specification system is a key component in producing quality documentation. The benefits of quality documentation include reduced project ambiguities, variations and re-work and a reduced likelihood of legal action due to contractual disputes. It is only through quality documentation that clients can be assured of a quality result.

Again, in the words of Bryce Mortlock:

*'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.'*⁵

Quality is reliant on good documentation and good documentation is incomplete without a good specification.

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⁵ RAIA Practice division report, NATSPEC, 1989.

Presenter

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