

Developing specifications

Office of the Chief Advisor - Procurement

Developing specifications

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Disclaimer

This document is intended as a guide only for the internal use and benefit of government agencies. It may not be relied on by any other party. It should be read in conjunction with the Queensland Procurement Policy, your agency's procurement policies and procedures, and any other relevant documents.

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Purpose of this guide

The purpose of this guide is to provide information and practical advice about developing written requirements (specifications) for procuring goods and services.

What is a specification?

In a procurement context, a specification can be defined as a statement of needs. It defines what the procurer wants to buy and, consequently, what the supplier is required to provide. Specifications can be simple or complex depending on the need.

The success of the procurement activity relies on the specification being a true and accurate statement of the buyer's requirements.

Apart from being a means of identifying the goods or services required, a specification will form part of any future contract that might result from offers received.

The specification forms part of an "Invitation to Offer" document. Other elements in the invitation document include the "Conditions of Offer", the "Conditions of Arrangement/Supply/Contract" and response schedules.

A good specification should:

- state the requirement clearly, concisely and logically in functional and performance terms unless specific technical requirements are needed
- for goods, state what the item will be used for
- contain enough information for offerors to decide and cost the goods or services they will offer and at what level of quality
- permit offered goods or services to be evaluated against defined criteria by examination, trial, test or documentation
- state the criteria for acceptance of goods or services by examination, trial, test or documentation
- provide equal opportunity for all potential suppliers to offer goods or services which satisfies the needs of the user, including goods or services incorporating alternative solutions
- form the fundamental basis of the contract between buyer and seller
- not over-specify requirements
- not contain features that directly or indirectly discriminate against people with disability, but allows optimal access and inclusion
- not contain features that directly or indirectly discriminate against Australian and New Zealand suppliers
- for procurements covered under either the Australia-United States or Australia-Chile Free Trade Agreements, contain features that directly or indirectly discriminate against suppliers from a participating country or are otherwise contrary to the Agreements.

About specifying brand names

While it is recognised that in some instances it is more practicable to nominate a brand name for the purpose of defining acceptable functional, performance and/or technical standards, it is not acceptable practice to routinely specify brand names.

In cases where brand names are used to define the functional, performance and/or technical requirements, Queensland manufactured products should, where practicable, be specified as the -first option.

Nomination of these products should only be used to define the required product standard. The specification should also invite offers of equivalent products, that is, products meeting similar functional, performance and/or technical standards, on the basis that an equivalent product will be evaluated along with the nominated brand name.

Overseas brand names may be specified only where there are no Australian or New Zealand manufactured products available which meet similar functional, performance and/or technical standards. Again, offers of equivalent products should be invited.

The priority order for specifying products is:

1. function, performance, technical specification
2. Australian or New Zealand manufactured brand name (more than one if possible), or equivalent product, when specification under 1 (above) is not practicable
3. overseas brand names, or equivalent product, when specification under 1 and 2 (above) is not practicable.

For assistance in identifying locally manufactured products contact Industry Capability Network Queensland.

Types of specifications

There are three types of specifications.

Functional specifications

These are specifications that define the function, duty or role of the goods or services. It nominates what the goods or services are broadly required to do. Functional specifications define the task or desired result by focusing on what is to be achieved rather than how it is to be done. They do not describe the method of achieving the intended result. This enables suppliers to provide solutions to defined problems. For example, a specification for *“an accessible device capable of conveying children from their school to their homes”* does not limit responses to bus operators alone.

Performance specifications

These are specifications that define the purpose of the goods or services in terms of how effectively it will perform, that is, in capability or performance terms. Performance is a logical extension of function. Performance specifications define the task or desired result by focussing on what is to be achieved. They do not describe the method of achieving the desired result. This enables suppliers to provide solutions to defined problems. For example, a specification could be written: *“An accessible device is required to convey at least 30 children every afternoon of the school week from their school in a safe manner to their homes within a radius of the school of 15 kilometres. The device shall be capable of achieving this within 1 hour. The device shall be capable of maintaining a comfortable environment for the children at an average temperature of 22 degrees Celsius in all types of weather. The device should allow equitable access by all children”*. Such a specification does not limit offers to one type of transportation or one type of user.

Technical specifications

These are specifications that define the technical and physical characteristics and/or measurements of a product, such as physical aspects (for example, dimensions, colour, surface finish), design details, material properties, energy requirements, processes, maintenance requirements and operational requirements. They are used when functional and performance characteristics are insufficient to define the requirement.

All three types may be combined to form the one specification. While Government generally encourages the use of performance and functional specifications rather than technical specifications, certain requirements may not be adequately defined in these terms alone. Technical characteristics may be needed to define some requirements more clearly.

Why are functional and performance specifications preferred to technical specifications?

- Suppliers can offer alternative and innovative ideas and solutions.
- Offerors can focus on providing the best solution.
- The focus on outcomes should result in better value for money.

At times simple requirements can be better defined in technical terms. A simple description may be issued in a number of ways such as:

Exemplar specification

This gives an example of a known product or service which would be appropriate and allows for alternatives by including the words “or equivalent” or “or similar”. It may be necessary to specify items when the equipment is genuinely necessary and does not reflect a bias towards particular items or suppliers. The reasons for specifying the nominated items should be given. Try to specify at least two acceptable products to avoid suggestions of bias and to select from the widest possible range of solutions.

Samples

For some products it may be necessary to supply an actual example of the item required by the buyer department to the supplier. Suppliers must produce goods that are identical in all respects to the sample. Samples should only be used in appropriate circumstances with a complementary specification. Instances where samples may be used to specify requirements include clothing, footwear, Government badges, etc.

Drawings

Drawings can be used in a specification as technical characteristics or to provide guidance to offerors. Examples include site drawings, custom-made furniture for fit outs, system drawings and schematics.

Drawings in specifications involve risk. Requesting a supplier to produce an item to a drawing or set of plans is like nominating a brand name: the manufacturer is largely absolved of responsibility if the item does not work (providing, of course, that the item is built to the drawing of plan). There are contractual clauses to cover this eventuality, but the use of drawings as a specification generally requires the buyer to bear most of the risk of things going wrong.

In addition, seeking offers on the basis of drawings provides little opportunity for offerors to offer new or alternative solutions to the requirement. However, if research on the requirement shows that a drawing is the best way to define the need, it should be used.

Whenever a drawing is used as part of a specification, check to see if ownership of the copyright should reside with the department/agency. If in doubt seek both technical and legal advice. Australian Standards for drawings exist and these should be consulted when preparing and revising drawings.

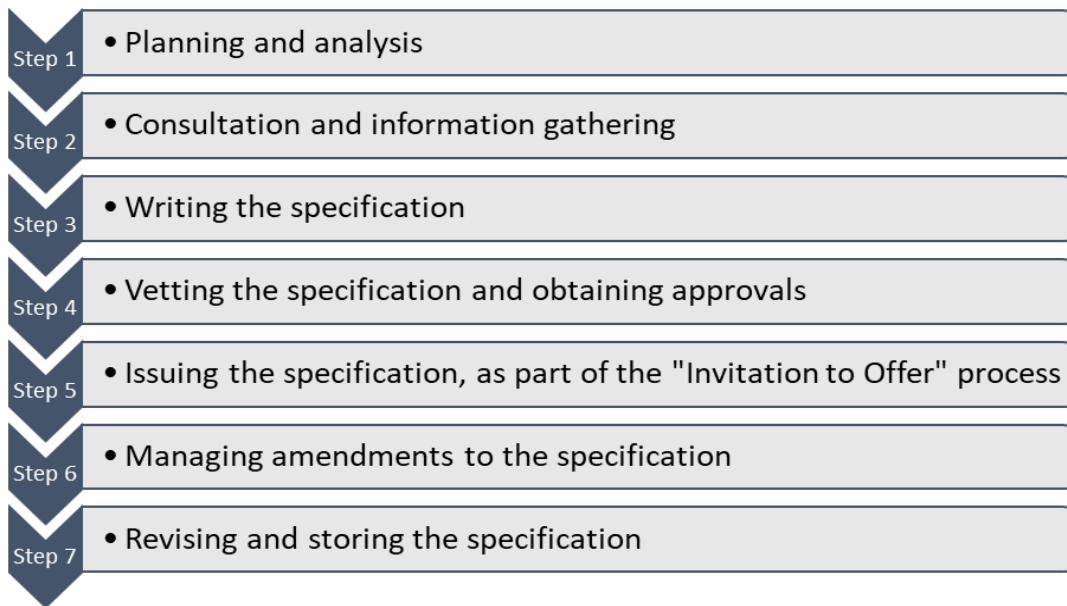
Evaluation criteria

Whatever methods are used to define the goods or services, there must be criteria to evaluate compliance of offers with the specification, legislative requirements or associated standards. Such evaluation criteria should be developed at the same time as developing the specification. They may be combined with other criteria, for example, price, accessibility, delivery, warranty, to give an overall assessment of the value for money represented by each offer. On the other hand, compliance may be a “pass” or “fail” to meet the mandatory requirements. Value for money may then be assessed on other variables.

Who is involved in developing the specification?

Users of the procured goods or services should be involved in defining their requirements together with appropriate project officers, technical officers (for example, information technology or medical staff) and procurement officers.

The process of developing the specification



Step 1: Planning and analysis

The foundation of a good specification is in the planning and analyses which are undertaken before writing begins. Key people who can help such as procurement staff, technical officers, project officers and managers, disability representatives and end users need to be involved. Planning and analysis will provide a better understanding of the requirement(s) and may reveal alternative solutions.

Planning and analysis are particularly important when developing complex requirements. These may take some time to define, perhaps even years in the case of major equipment. The accuracy and detail of the definition is likely to improve as information is gathered and assimilated.

Define the requirement(s) and then approach industry to see what is available to meet the department's/agency's needs. If industry is approached too early in the development process, there is the risk of deciding the solution to the problem before the requirement(s) is fully defined.

In some cases potential solutions may be discovered and explored which may allow refinement of needs. Think in terms of the performance required or the functions to be performed. In other cases, however, solutions may not be readily available or there could be the danger in stating a solution up front that may restrict offers of alternative solutions. In this situation, a full explanation of the issue or problem is needed.

Breaking down the requirement(s) in terms of function and performance will better define the need. Defining the requirement(s) in terms of the lowest level functions or sub components should also help to discover conflicts and inconsistencies within the requirement(s). Alternative solutions, too, may be revealed in the process.

Value analysis could be used to highlight and explore possible solutions. It is a complex cost analysis technique that requires expertise for its successful use. In simple terms, value analysis looks for the

optimum way of using materials, designs, equipment etc. to meet a (functional) requirement while providing savings over the life of the equipment or at the initial purchase stage. The technique is particularly useful in identifying potential, innovative solutions.

Step 2: Consultation and information gathering

Developing specifications requires consultation and can be perceived as an evolutionary process involving close and continuous liaison between the end-user, technical officers, project officers/managers, procurement officers and the specification writer.

Valuable information and advice relating to the requirement can be obtained by discussing it with procurement officers, technical officers and other users of similar goods or services within the department/agency. Procurement officers should be involved from the start of the process (that is, the information gathering and design stages).

Other sources of information include:

- other departments or agencies (including federal and local governments)
- industry - either industry associations or particular companies (ensure that industry does not assume pre-offer negotiations)
- educational institutions, for example, universities and TAFE Institutes
- Standards Australia
- Industry Capability Network Queensland which can assist in identifying and evaluating appropriate
- local industry capabilities
- disability representatives on category council industry reference groups
- other users of the goods or services.

These organisations may help to refine the requirement and also suggest potential solutions.

Step 3: Writing the specification

Some writing tips:

- use simple, clear language without jargon (to minimise misinterpretation)
- define terms, symbols and acronyms (include a “Glossary of Terms”)
- be concise
- do not explain the same requirement in more than one section
- define each aspect of the requirement in one or two paragraphs where possible
- adopt a user-friendly format
- number the sections and paragraphs
- seek feedback from someone unfamiliar with the requirement
- discuss the draft and refine it.

There are no fixed rules on formats and structures because each specification reflects a different requirement or need. A specification should list the functional, performance and technical characteristics separately.

Hint – Ideas for structure of the specification

You may get some ideas for structure if you:

- plan and analyse your needs
- arrange the components of the requirement into a logical form
- discuss the requirement with colleagues, other users and procurement officers.

Refine the structure before writing by discussing with colleagues and procurement officers. Include tables, sketches, diagrams, or statistical matter if these help to make the specification clearer. Be careful that these types of information do not limit the options for offerors to provide alternative solutions.

Hint – Define simple requirements simply

Most requirements are not complex and do not require staged refinement or detailed analysis. Most are simple, straightforward, easily defined and readily satisfied. For these types of goods and services, developing a detailed specification is impractical and not cost effective. Such requirements should be defined simply and in terms of function and performance

Step 4: Vetting the specification and obtaining approvals

After writing the specification, ask a colleague who is unfamiliar with the requirement to critique it from a potential supplier's view.

Try to identify improvements by considering:

- readability
- simplicity of meaning
- clarity
- logic.

Seek approval from the appropriate financial or procurement delegates in the department/agency after vetting the specification but before issuing it.

Step 5: Issuing the specification

The specification should be included as part of the "Invitation to Offer" document.

Step 6: Managing amendments to the specification

Should a need arise to amend the specification during the "Invitation to Offer" process, the amendment should be authorised by the project manager. The amended specification should be noted in the project files and all offerors or potential offerors must be given a reasonable opportunity to offer to the new specification.

Step 7: Revising and storing the specification

The specification should be reviewed at the end of the procurement activity to ensure that it effectively defined the goods or services that were actually bought. If areas for improvement are identified, revise the specification with the benefit of hindsight.

When the review of the specification has been completed and if it relates to goods or services that are likely to be procured frequently, keep it on file. Before each procurement, review the specification to ensure that it reflects your department's/agency's needs at that time. Alternatively, institute a program to review specifications on a regular basis.

Staged procurement

When to use staged procurement

When the requirement is complex and there are many potential solutions, consider refining the requirement and developing the specification in stages. This approach allows requirements to be refined in response to a narrowing range of solutions.

Key considerations when refining a requirement in stages:

- ensure that all participants understand that the process is in stages to refine the specification and that their input may be incorporated in the final version
- revise the specification after each stage to incorporate additional information or refinements
- maintain the functional and performance nature of the specification
- ensure that the final version of the specification allows for the development of practical and effective evaluation criteria
- ensure that all activities are directed at obtaining goods or services which will meet the needs of the user.

What information is included in a specification?

After agreement about what information will be included in the specification and an appropriate structure, it must be formatted into a useable specification.

There is a range of information that can be included in a specification. Including particular topics will depend on the nature of the goods or services being specified. This guide outlines 16 topics. The list is not exhaustive and there may be other topics that are needed.

1. Title
2. Table of contents
3. Introduction
4. Scope
5. Background information or history of the required goods and services
6. List of terms, symbols and acronyms (glossary)
7. List of relevant documents
8. External approvals
9. Security aspects
10. Environmental and ergonomic limitations
11. Detailed requirements
12. Whole-of-life support
13. Marking of supplies
14. Preservation and packaging
15. Quality requirements
16. Testing.

Hint

With each of the above topics ask yourself, *“Will this topic help me define what I need?”*

Title

Use a simple description of the specified goods or services for the title.

The title should be as broad as possible to allow alternative solutions to be offered. To achieve this, particular materials (for example, steel or timber) or energy sources (e.g. electricity) or other restrictions should not be included in the title unless they are essential.

Use broad, open titles to describe the basic function (for example, “Materials Handling Equipment” or “Waste Management”) where more than one type of solution may be available.

Where a range of goods or services is required the title should encompass the generic nature of those goods or services.

Hint – Offeror interest

Remember that potential suppliers may decide not to make an offer solely on the basis of the title.

Table of contents

A table of contents needs to be considered particularly for longer and more complex specifications.

Introduction

An introduction sets the scene for the specification by describing the required goods or services in the larger context of the department/agency. A well written introduction will increase potential suppliers’ interest in the invitation and help them to understand the department’s/agency’s needs. Detailed requirements should not be included in the introduction.

The decision to use an introduction will be influenced by such factors as:

- the expected level of public awareness about the department/section
- the complexity of the required goods or services
- the novelty or innovativeness of the required goods or services or their intended use
- the need to describe the required goods and services in a larger context.

Scope

The scope is a general statement or summary about the required goods or services.

Complex specifications are more likely to benefit from a scope section than simple ones. However, even for simple specifications a scope may represent an effective way to highlight the main aspects of the requirement.

Consider writing the scope as a stand-alone statement of the requirement. This will permit procurement officers to use the scope in offer and contract documents as well as in advertisements seeking offers.

The scope should include a brief description of the requirement and the application, purpose or function of the goods or services required.

Background information or history of the required goods and services

Goods or services that are complex may be better understood by potential offerors if their history is explained. Giving offerors information about how and why the requirement arose can help them decide their best solution.

Background information includes:

- the origin of the need for the required goods or services
- the current need for the goods or services
- an outline of the research which has been undertaken into the goods or services
- what options (if any) have been considered
- what options have been dismissed and why
- a description of the current system, equipment and methods which will be replaced by the goods or services being defined or solutions being sought
- how this requirement is related to earlier purchases and perceived future requirements
- the implications for the user resulting from implementing the selected solution.

List of terms, symbols and acronyms (glossary)

- Use acronyms and symbols sparingly.
- Do not assume that such words and phrases will be understood or interpreted correctly by offerors (if in doubt, research the market to find the commonly used terms).
- Use a glossary to define abbreviations, acronyms, technical terms or symbols if there is a need to use them.
- Jargon should not be used (unless it is a well-accepted industry standard).
- Use accepted definitions or standards to explain acronyms and symbols.
- Place the glossary where it best assists reading and understanding the specification.

List of relevant documents

Provide a list of all documents referred to in the specification rather than including the actual documents or extracts. Documents that are readily available commercially, or which offerors can reasonably be expected to already hold, do not need to be provided. However, unusual or hard to find documents should be provided to offerors. But be prepared to provide a copy of any relevant document if an offeror makes the request.

Documents most commonly referred to include other specifications, Standards, reference publications, Codes of Practice, Acts of Parliament and Government directions and regulations. Nominate the part(s) of the specification to which each document applies.

Determining which documents to reference should be part of the analysis of the requirement. List only primary documents (that is, those documents actually referred to in the specification). Secondary documents should not be listed as they are automatically invoked by implication.

Standards

Standards are the most frequently nominated documents. These are generally produced by Standards Australia, the International Organization for Standardization, professional organisations, individual companies, industry organisations, and commonwealth and state departments/agencies.

Only list Standards relevant to the required goods and services. Similarly, where Standards are mandatory for a particular good or service, ensure that they are included. Because Standards are revised from time to time, nominate the current version to be used.

Inappropriate Standards, or those which are too stringent, will not guarantee the integrity of the goods or services and may contribute to a higher cost. Requirements for off-the-shelf items in particular offer little opportunity to invoke Standards other than those generally used by industry (e.g. electrical safety standards).

Precedence of documents

Nominating documents raises the possibility of inconsistency between the specification and the other documents or between the other documents. To help minimise this possibility, relevant documents should be given an order of precedence. The specification should be given importance in this order and then all other documents from the most specific to the most general, making the latter the least important.

Acts of Parliament or Government directions or regulations that affect the required goods or services, of course, take precedence over the specification.

Hint – Offeror interest

Ensure you consider and appropriately action any obligations that various legislation may require, for example, requirements under the *Disability Discrimination Act 1992 (Cth)* and *Work Health and Safety Act 2011*.

External approvals

A contractor may need approval from a relevant authority to perform certain work under the contract. For example, to make an electrical connection, close roads or access properties for survey work. It is normally the contractor's responsibility to make arrangements for obtaining any approvals or certifications necessary for the completion of the task in accordance with the laws of Australia, Queensland and any by-law, ordinance etc. that may be applicable.

Security aspects

Define the required security measures the offeror may need to consider.

A purchase may require security measures to:

- protect the community's interest
- safeguard personal information
- provide confidentiality of commercial information
- safeguard expensive equipment.

Where security considerations apply, they should be listed but only to the extent that they affect the definition of the requirement. General security aspects of the procurement, along with procedures for managing security, should be given in the offer and contract documents. Consult relevant departmental officers if there is uncertainty about security considerations.

Environmental and ergonomic limitations

The physical environment in which the goods or services will operate, or be located, may have an impact on their design or performance. These limitations and constraints should be stated in the specification.

Limitations may include:

- operating and storage conditions (e.g. maximum and minimum temperatures, noise, pressure, humidity, atmosphere, altitude, shock, vibration, radiation, terrain, dust, chemicals, electrical interference)
- the physical space available for installing equipment
- the effects on the environment of using the equipment or providing the service

- the need for interchangeability or compatibility with existing equipment, systems, etc. – the nature of, and reason for, this must be stated to give offerors the opportunity to adapt products accordingly
- availability of energy and other services
- intended users of the product and their ergonomic requirements (e.g. suitability for use by people who use wheelchairs or have other access needs)
- personnel safety aspects
- provisions needed for unskilled people or people with disability (e.g. the need for signs/labels in various languages)
- servicing or maintenance requirements or limitations.

Hint – Standardisation

Standardisation means adopting particular goods or services to satisfy future requirements of that type, usually for a specified period of time. The need for interchangeability or compatibility of equipment is not the same as standardisation. The former terms refer to the need for equipment to operate harmoniously with other equipment. The need for, and benefits of, standardisation should be identified and justified during planning and analysis. Potential suppliers should be advised that the accepted product would become the standard one for use within the buying department/agency.

Detailed requirements

This section in the specification describes the requirement in detail. The amount of detail provided should reflect the complexity of the requirement. Allow for alternative solutions when defining the requirement.

Detailed requirements are usually best described as:

- functional characteristics
- performance characteristics
- technical characteristics
- other aspects.

Combining performance and functional characteristics provides the opportunity for suppliers to offer solutions tailored to the requirement based on their product and service range. Alternative solutions should be assessed against the evaluation criteria, including an assessment of any desirable features offered as part of each solution.

Other aspects

If parts of the required goods or services are not easily defined in terms of function, performance or technical characteristics, these should be defined separately. For example:

- site preparation
- installation
- drawings
- training
- maintenance services
- reports and other documentation (e.g. equipment handbooks, software, computer file listings).

Hint – Increase clarity

It is understood that variation in specifications can occur at different stages of the procurement process. Officers need to, however, ensure that any specification requirements detailed in the subsequent contract

documentation is based on a single agreed specification, where possible, to minimise the potential for inconsistencies and uncertainty in interpreting contractual obligations.

Whole-of-life support

If requirements for equipment include their maintenance, modification or upgrade during use (e.g. mainframe computer systems, air conditioning plants and scientific devices) the specification should address reliability, availability and maintainability in order to minimise whole-of-life costs of the equipment. This information should be included whether the equipment is to be maintained or operated by the supplier or by the department/agency.

Analysis of reliability, availability and maintainability can be a complex and difficult area requiring expert technical skills and knowledge. Use of value analysis can help optimise reliability, availability and maintainability requirements during requirement analysis and equipment design. Consider possible upgrades and avenues for upgrading equipment and software. Define what additional or enhanced capability is, or may be, required. Include in the request for offers the timeframe for implementing the upgrade and information required to evaluate the offers received.

Marking of supplies

Goods purchased by the government can be marked to:

Denote government ownership

Departments/agencies need to decide what identification markings, if appropriate, should be applied to goods purchased.

Identify the item

Many off-the-shelf products are marked with the name of the manufacturer and the model number. Specify if more (or less) is required but changing the standard, commercially produced item will probably be expensive.

Provide warnings or other cautionary information

Warnings and cautionary information will be required where there is potential for injury to operators, maintainers or bystanders. Sometimes such warnings are a legal requirement. Check what needs to be done in each case.

Address consignments

Be clear about the address to which the package or consignment is to be delivered.

Note special precautions

Any special storage, operating, handling or packaging needs should be identified (e.g. "Store below 45 degrees Celsius" and "This way up").

Preservation and packaging

Items may need to be preserved and/or packaged before delivery. Preservation is protecting an item from damage or degradation during shipment and storage (e.g. by dipping it in wax or infusing it with a chemical preservative). Packaging is the provision of an outer wrap to protect an item (for example, a foam-lined box).

The level and type of preservation and packaging required depends on the item, type of transportation, its use and the responsibilities of the contractor. Contracts for supply and installation of equipment need not

nominate any preservation or packaging requirements, as these are the responsibility and risk of the contractor. The risk associated with goods in transit should be dealt with in the contract for supply.

Off-the-shelf commercial standards may be adequate. Nominating higher standards may delay delivery and increase costs. Use preservation and packaging standards wherever possible or define requirements in functional and performance terms (e.g. “Packaging suitable for transport by (mode) to the site of installation” or “Preservation to ensure no corrosion in a commercial-type warehouse storage”).

Dangerous goods need special care. Refer to the Australian Code for the Transport of Dangerous Goods by Road and Rail, International Air Transport Association (IATA) regulations and other similar codes of practice.

Quality requirements

For purchasing purposes, quality can be broadly defined as fitness for purpose. It is the totality of an item’s characteristics which make it suitable to satisfy a department’s/agency’s needs. Quality can cover attributes such as reliability, performance, standard of workmanship, accessibility inclusions, conformance of design and economic and perceived value.

Including quality requirements into a specification is one of the methods of managing the risks associated with the goods and services required by a department/agency. The aim is to remove, transfer or minimise these risks before the goods or services are acquired. The seriousness of these risks depends on the likelihood and consequences of something going wrong with either the acquired goods or services or with the procurement.

Testing

Goods are tested to ensure that they meet the requirements of the specification. If standards or other documents have been specified, they may list tests to assess certain aspects of the item (e.g. electrical safety).

These tests will have to be performed by the contractor to satisfy those documents. In the specification or “Invitation to Offer” documents be clear about who is responsible for testing.

Other tests may need to be specified. These should cover all aspects of the requirement and be designed to prove that the product offered is suitable for its intended purpose. Specifying the tests includes nominating the criteria for passing or failing those tests as well as the implications of failing. Criteria for passing the tests as a package (as opposed to passing each test) should also be stated.

The supplier may develop and conduct tests for some requirements. The right to approve the contractor’s testing plans should be specified before they are implemented.

Testing may be conducted through an independent organisation instead of the supplier. National Association of Testing Authorities (NATA) may be used for technical tests in purchasing. For more information refer to the NATA website at www.nata.com.au.

Get proof of all test results from the supplier. Accordingly, nominate pro forma or test certificates to be completed by the contractor or other testing organisation.

Information which should not be included in specifications

Excluding unnecessary information is as important to preparing an effective specification as including relevant information. These decisions can be difficult to make so consult with procurement officers to resolve uncertainties about what information belongs in the specification and what information belongs in the other “Invitation to Offer” documents.