

Australian/New Zealand Standard™

Quality system guidelines

**Part 12: Guide to AS/NZS 9001:1994
for architectural and engineering
design practices**

AS/NZS 3905.12:1999

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AS/NZS 3905.12:1999

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PREFACE

This Guide was prepared by the Joint Standards Australia/Standards New Zealand Committee QR/2, Quality of Service.

The objective of this Guide is to provide guidance to architectural and engineering design practices operating in the building and construction industries on the adoption of quality management systems within the practice as a method of assuring professional standards of performance, managing for quality improvement and satisfying contractual and certification requirements.

The primary aim of this Guide is to explain the requirements of AS/NZS ISO 9001:1994, *Quality systems—Model for quality assurance in design, development, production, installation and servicing* in terms which can be readily understood and are relevant to architects and engineers, or other designers, consultants and professionals practising in the building and construction industry. It further aims to suggest approaches to quality system implementation appropriate to a design practice, and to highlight potential benefits.

Although the guidance and examples provided tend to reflect the model of a small to medium private practice, the reader should be able to adapt the guidance to related applications, such as larger practices, in-house design groups within private organizations or public utilities, other design disciplines, or to circumstances where the practice provides professional services other than design.

This Guide addresses the requirements of AS/NZS ISO 9001 (also referred to herein as ‘the Standard’). Section 4 of this Guide follows the format of AS/NZS ISO 9001, for ease of cross-referencing. Sections 2 and 3 provide general guidance relevant to quality system implementation in the design consultancy context.

This Guide is complementary to and is compatible with AS/NZS 3905.2, *Quality system guidelines, Part 2: Guide to AS/NZS ISO 9001, AS/NZS ISO 9002, and AS/NZS ISO 9003 for construction*, which focuses on construction projects. However, this Guide focuses on the design practice, and on planning, management and design issues within the practice itself, and therefore defines the term ‘project’ differently. Reference should be made to AS/NZS 3905.2 for guidance on the application of quality systems to construction projects, for specifying requirements for quality assurance on projects, and for performing building and construction related activities that are not directly related to design.

This Guide also recognizes the guidance provided in AS 3904.2/NZS 9004.2/ISO 9004-2, *Quality management and quality system elements—Guidelines for services* and other related publications, of which further information is provided in Appendix A.

The term ‘informative’ has been used in this Standard to define the application of the appendix to which it applies. An ‘informative’ appendix is only for information and guidance.

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Australian/New Zealand Standard**Quality system guidelines****Part 12: Guide to AS/NZS ISO 9001:1994 for architectural and engineering design practices**

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Guide provides guidance on the application of AS/NZS ISO 9001 to architectural, engineering and similar design practices, including the development of effective quality systems for use within a practice.

1.2 APPLICATION AS/NZS ISO 9001 is the appropriate Standard for use in architectural, engineering and other design practices, as it includes design considerations under Clause 4.4, Design control.

The focus of this Guide is on explaining the requirements of the Standard in terms relevant to practices that mainly provide design services to the construction industry. Requirements for design control apply to design of all stages of construction projects.

This Guide includes limited guidance only on activities other than design. For organizations which also engage in construction industry activities such as provision of professional advice, project management, contract planning and administration, supervision, site work, inspection, testing and purchasing services, reference to AS/NZS 3905.2 is recommended.

The Guide can also be used by the clients of a design practice in developing a clearer understanding of the requirements for quality assurance and the evaluation of a practice's quality system.

1.3 REFERENCED DOCUMENTS Refer to Appendix A for information on relevant Standards and publications, including documents referenced in this Guide and in AS/NZS ISO 9001, and international Standards that have been adopted as Australian/New Zealand Standards.

1.4 TERMINOLOGY The guidance provided in this Guide generally includes explanations of quality terms and concepts which reflect the definitions provided in AS/NZS ISO 8402. The glossary below provides explanations of terms used in this Guide.

Term	Definition
Construction	Building or engineering works of any description.
Contract (AS/NZS ISO 9001)	Agreed requirements between a supplier and a customer (e.g. between a design practice and a client) transmitted by any means. NOTE: For a design practice, the guidance relating to contracts and contract review should be interpreted as including a commission, engagement or agreement, which may be written or verbal.

Customer (client, purchaser)	The 'customer' is defined as 'the recipient of a product provided by the supplier'. This includes all the clients of the practice. Where the term 'client' is used throughout this Guide it means the customers of the practice.
Procedure*	A specified way to perform an activity. NOTES: 1 In many cases, procedures are documented (e.g. quality system procedures). 2 When a procedure is documented, the term 'written procedure' or 'documented procedure' is frequently used. 3 A written or documented procedure usually contains the purposes and scope of an activity; what shall be done and by whom; when, where and how it shall be done; what materials, equipment and documents shall be used; and how it shall be controlled and recorded.
Process*	A set of inter-related resources and activities which transfer inputs into outputs. NOTE: Resources may include personnel, finance, facilities, equipment, techniques and methods.
Product	Result of activities or processes. Products of a design practice may include advice, reports, models, drawings, specifications, project documentation and certificates. A product may include service, hardware, processed materials, software or a combination thereof.
Project	An activity or series of related activities to achieve defined objectives.
Proposal	An offer by a design practice to provide design or other professional services to a client or potential client.
Nonconformity*	Nonfulfillment of a specified requirement. NOTE: The definition covers the departure or absence of one or more quality characteristics or quality system elements from specified requirements.
Quality manual*	Document stating the quality policy and describing the quality system of an organization. NOTES: 1 A quality manual may relate to the totality of an organization's activities or only to a part of it. The title and scope of the manual reflects the field of application. 2 A quality manual will normally contain or refer to, as a minimum — (a) quality policy; (b) the responsibilities, authorities and inter-relationships of personnel who manage, perform, verify or review work affecting quality; (c) the quality system procedures and instructions;

* These definitions are based on AS/NZS ISO 8402, *Quality management and quality assurance—Vocabulary*.

(d) a statement for reviewing, up-dating and controlling the manual.

- 3 A quality manual can vary in depth and format to suit the needs of an organization. It may comprise more than one document. Depending on the scope of the manual, a qualifier may be used, for example, 'quality assurance manual', 'quality management manual'.

Quality assurance*

All the planned and systematic activities implemented within the quality system and demonstrated as needed, to provide adequate confidence that an entity will fulfil requirements for quality.

Quality management*

All activities of the overall management function that determine the quality policy, objectives and responsibilities; and implement them by means such as quality planning, quality control, quality assurance and quality improvement within the quality system.

NOTES:

- 1 Quality management is the responsibility of all levels of management but must be led by top management. Its implementation involves all members of the organization.
- 2 In quality management, consideration is given to economic aspects.

Quality plan*

A document setting out the specific quality practices, resources and sequence of activities relevant to a particular product, project or contract.

NOTES:

- 1 A quality plan usually makes reference to the parts of the quality manual applicable to the specific case.
- 2 Depending on the scope of the plan, a qualifier may be used, for example, 'quality assurance plan', 'quality management plan', 'project quality plan'.

Quality planning*

Planning activities that establish the objectives and requirements for quality and for the application of quality system elements.

Quality system*

Organizational structure, procedures, processes and resources needed to implement quality management.

NOTES:

- 1 The quality system should be as comprehensive as needed to meet the quality objectives.
- 2 The quality system of an organization is designed primarily to satisfy the internal managerial needs of the organization. It is broader than the requirements of a particular customer, who evaluates only the relevant part of the quality system.
- 3 For contractual or mandatory quality assessment purposes, demonstration of the implementation of identified quality system elements may be required.

* These definitions are based on AS/NZS ISO 8402, *Quality management and quality assurance—Vocabulary*.

**Subcontractor
(subconsultant)**

Organizations that supply product, such as goods or services, to the practice are referred to as 'subcontractors'. This would include subconsultants and specialist services which provide information, e.g. as design input.

**Supplier
(‘the practice’, ‘the
design practice’)**

In the context of this Guide, the 'supplier' is the design practice, firm or organization.

The term 'supplier' is used throughout AS/NZS ISO 9001 to describe the organization that provides a product to a customer, and to which the requirements of the Standard apply.

This Guide uses 'the design practice' or 'the practice' to describe a broad range of 'supplier' organizations, which could include individual consultants, a partnership or associated entity, a company, a design division within a company, corporation, consortium or government body.

Tender (AS/NZS 3905.2)

An offer by a supplier to provide product to satisfy the award of a contract, usually made in response to a customer's invitation.

* These definitions are based on AS/NZS ISO 8402, *Quality management and quality assurance – Vocabulary*.

SECTION 2 QUALITY SYSTEMS AND THE DESIGN PRACTICE

2.1 GENERAL This Guide takes the approach of explaining how a quality system satisfying the requirements of AS/NZS ISO 9001 can be implemented in a way that builds on the existing management and control systems of a design practice.

For an architectural, engineering or similar design practice, AS/NZS ISO 9001 needs to be understood in an industry context, in order to develop a quality management system which is based on AS/NZS ISO 9001 principles and existing management methods, controls and systems, since the Standard is not intended to be applied in a fixed, prescriptive manner.

Every practice will have an established way of running its business, with some informal activities and some formalized. Implementing a formal quality management system may mean formalizing some informal procedures and enhancing some procedures to include mechanisms which address relevant requirements of AS/NZS ISO 9001.

The Standard relates to supplier-customer relationships. When a practice (supplier) is asked to operate under a quality system, the client (customer) is seeking additional confidence that the practice's services and output will satisfy their needs, without the client having to check it closely. However, a practice's quality system will often be more comprehensive than needed to meet the requirements of a particular client or project.

For quality assessment purposes, the practice will also have to be able to demonstrate the implementation of the quality system or applicable quality system requirements to others.

2.2 CHARACTERISTICS OF EFFECTIVE QUALITY SYSTEMS Although quality systems cover a wide range of styles and methods, many effective systems share common characteristics, and are accepted by those who use them as representing common sense and good business practice. The following broad guidelines may be helpful in establishing the characteristics, scope and structure of the system:

- (a) The system should have strong commitment from the practice's principals and senior managers, as characterized by their visible and active support, and their involvement in the planning, implementation, review and improvement of the system.
- (b) The system should aid the planning, management, and control of work; it should highlight critical activities and identify issues such as risks to the practice which may need particular care and control.
- (c) The system should be functional and 'user friendly', i.e. it should reflect the major processes and structure of the practice and the way people work, and be sufficiently flexible to be suitable for a range of project applications and client needs.
- (d) The system should encompass the whole service to the client, from initial contact to evaluating client satisfaction.
- (e) It should provide consistency without unnecessarily restricting the way personnel carry out their work. There should be a high level of understanding by users of how it operates and how it is an integral part of practice management.
- (f) The system should be an effective aid to good communications. It should identify the delegations of responsibility and authority, the flow of work and project interfaces. Personnel should understand their roles and the roles of others they work with.
- (g) The system should provide a means of tracing, measuring and auditing outcomes, e.g. by providing information and records in a format which is useful for management overview, and which satisfies AS/NZS ISO 9001 requirements.
- (h) The system should aid the smooth running of projects and the satisfaction of client needs.

- (i) The system should not result in unnecessary bureaucracy or paperwork.
- (j) The system should include mechanisms for evaluation and improvement.

Management commitment will be achieved more readily if the practice's quality system objectives are clearly aligned with its business goals and objectives, and if the potential for return on the investment in the quality system is understood by all personnel.

An effective quality system, employed as a suite of management tools, can lead to improvement of work processes and product quality, by providing a systematic approach to managing the practice's business activities and controlling risk.

2.3 THE PROCESS MODEL AS/NZS ISO 9001 requires that all processes that directly affect quality (including design, other professional services and business processes) are planned, documented, then implemented under controlled conditions.

Processes are sets of inter-related resources and activities which transform inputs into identifiable outputs. An understanding of processes provides a basis for their management, control and improvement.

The Standard encourages a *systematic* approach, by applying the concept that all work is accomplished by a *process*. This introduces requirements for management tools such as planning, control, audit, evaluation and management review, based on the underlying principle that desired results may be achieved effectively by managing activities and related resources as a process or series of processes.

The process model can then be further interpreted in terms of the Plan-Do-Check-Act (P-D-C-A) cycle, as illustrated in Figure 1.

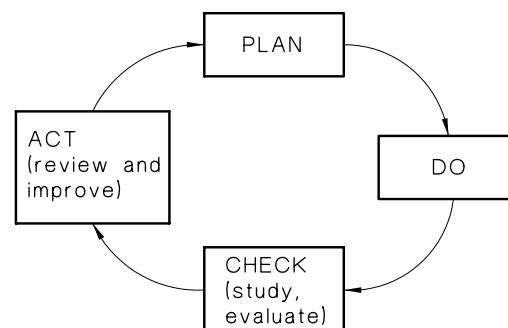


FIGURE 1 PLAN-DO-CHECK-ACT (P-D-C-A) CYCLE

Figure 1 represents a simplified interpretation of a well-known model for process improvement. It can provide a useful framework for understanding, managing and controlling processes. This can then lead to ways of identifying potential improvements, trialing new methods, checking results and, if appropriate, implementing the improved process. For a design practice, it involves the following steps:

- | | |
|-------------|---|
| <i>Plan</i> | Planning design activities and other services in order to provide outputs that satisfy customer requirements. |
| <i>Do</i> | Doing and controlling the work as planned (e.g. by ensuring that both in-house and subcontracted work is done by competent people). |

<i>Check (Study, measure and evaluate)</i>	Establishing a regime of measuring, evaluating and verifying that output is consistent with the client's requirements; and identifying, acknowledging and rectifying any nonconformity in procedures or output.
<i>Act (Review and improve)</i>	Reviewing the effectiveness of the practice's planning and business processes to detect any deficiencies; taking action if opportunities for improvement are identified.

In a design practice, the necessary control over processes that involve professional skills and judgement will be provided primarily by ensuring that the work is —

- (a) planned;
- (b) performed by competent people, who are provided with required resources, and who have access to necessary information; and
- (c) evaluated at appropriate points during the process.

Resources can include personnel, finance, equipment, programs, knowledge, techniques, methods and reference material. They may also include facilities, software, support systems, assistance, skills and training. In addition to experience, ongoing training or education of personnel will usually be required to ensure that the capability of the practice is maintained (see Clauses 4.1.2.2 and 4.18).

Evaluation activities include review, verification, validation, inspection and test.

2.4 PLANNING AS/NZS ISO 9001 emphasizes the importance of planning as an essential function of management. Planning is required for all activities that affect quality, including design planning, and planning how quality requirements will be met. Quality planning is applicable to a design practice's core design activities and professional services, and may include support functions and activities not directly related to a specific product, project or contract.

The Standard includes specific requirements for planning (e.g. see Clauses 4.2.3, 4.4.2 and 4.9) and also requires the output of this planning process to be documented. Clause 4.2.3 states that 'Quality planning shall be consistent with all other requirements of a supplier's (i.e. the practice's) quality system and shall be documented in a format to suit the supplier's method of operation'.

The planning of routine or repetitive activities can be documented in the practice's standard procedures, instructions or training programs. Where planning is recorded in separate documents, these are referred to collectively as quality plans, examples of which are design plans (as required by Clause 4.4.2) and project quality plans. (See Appendix B and AS/NZS 3905.2 for further guidance on project quality plans.)

2.5 DOCUMENTATION A quality management system must be documented. Systems, and the ways in which they are documented, will vary from organization to organization, reflecting factors such as the nature of the practice, its management policy and objectives, business and marketing plans, personnel and the scope and complexity of the projects it undertakes.

Quality system documentation should be concise and easy to use, and should communicate the quality policy, procedures and management style of the practice in a practical, realistic manner. Documentation should include—

- (a) a quality policy statement;
- (b) a quality manual which describes the system and how the requirements of AS/NZS ISO 9001 are addressed;

- (c) documented procedures specifying how the quality system is implemented and maintained; and
- (d) supporting documents such as an organization chart, authority matrix, work instructions and quality plans.

The quality system documentation should describe how the practice manages and controls work. AS/NZS ISO 9001 sets out requirements for *what* is to be done but does not prescribe *how*. Each design practice should determine which requirements are relevant to its operations, how it will document them, and how it will demonstrate compliance. Guidance is provided in Section 4 (e.g. see Clause 4.2).

Although Section 4 of AS/NZS ISO 9001 sets out requirements under 20 headings, there is no obligation to arrange the documentation of a quality system in this manner, and it is preferable for the documentation to be arranged to reflect the organizational structure and major processes of the practice. Where the headings and structure chosen are different from those in the Standard, it can be helpful to include a table, matrix or cross-reference list when preparing the documentation.

Clause 4.9 states that documented procedures are required where the absence of such procedures could adversely affect quality. The extent and detail of any procedure should reflect the competence of personnel using the procedure, the complexity of work and how often it is done, consistency of implementation by various personnel, and the need for consistency of output. Documented procedures are also helpful in training personnel.

Procedures should specify the functional work flow and relevant controls within the practice, and may include a cross-reference to relevant clauses of the Standard. Several clauses may be addressed in a single procedure. Also, where there are several different applications for a particular requirement of AS/NZS ISO 9001, separate procedures may be warranted for each application. Unnecessary duplication of procedures should be avoided.

Procedure documents can be separate from, and simply referenced in, the quality manual. Alternatively, the quality manual and procedures can be combined in a single volume where appropriate, e.g. for a small practice. The details of how work is performed may be confidential information, and can be documented in instructions or practice notes that are referenced in the manual or procedures.

Supporting documents could include, for example, documents noted in the guidance under Clauses 4.5 and 4.16, or planning documents described in Appendix B.

Where existing procedures do not cover the full range of activities for a specific project, additional or modified procedures may need to be prepared. These are usually included in or referenced in a design plan or a quality plan for the project (see Appendix B).

2.6 RECORDS Implementing a quality system includes keeping records to demonstrate that the system is operating effectively. A design practice's records will largely relate to work carried out on individual projects for clients. Records will also be generated for management reviews, audits, corrective/preventive actions, staff training, purchasing and other support activities. Guidance on management of quality records is provided in Clause 4.16.

SECTION 3 PLANNING, DEVELOPING, IMPLEMENTING AND IMPROVING A QUALITY SYSTEM

3.1 INITIAL PLANNING Planning for a quality system should follow an initial overview to determine that the scope and objectives of the quality system will suit the business goals of the practice. The broad framework should be established after —

- (a) analysing the practice in terms of its strategic goals, customers and potential market;
- (b) identifying the full range of professional services that the practice provides, or intends to provide;
- (c) analysing how the practice currently manages its business, its style of operations and how it controls its resources and work;
- (d) deciding on the scope of the quality system to meet the needs of the practice and its clients; and
- (e) examining the requirements of AS/NZS ISO 9001 and relevant guidance, including Section 4 of this Guide.

This initial planning will affect both the flexibility and ease of use of the quality system after its implementation, and the cost of maintaining the system. The aim should be to keep the system simple and develop it around any existing procedures and business practices that have proven effective.

The important issue is to develop a quality system which is appropriate for the needs of the practice (see Clause 2.2).

To comply with AS/NZS ISO 9001, it is not necessary for the practice's formal quality system to cover activities and business processes that do not affect services to clients, such as business development, marketing, financial management of the practice and office administration. However, it may be a client requirement, and it can be in the interests of the practice, to develop and document such objectives and procedures as an extension of the quality system.

3.2 QUALITY SYSTEM PLANNING Planning the development, implementation and improvement of a quality system can be likened to other project planning activities, such as planning a construction project.

First a broad concept is required which satisfies general requirements. This concept then needs to be developed and tested. Design of the component parts in more detail is then undertaken. Evaluation of this design development follows, to confirm that the parts fit within the broad concept. Sometimes during design development it is necessary to amend the broad concept, to take account of new information. Subsequent projects build on previous design experience and solutions, and improved designs often result.

A plan of work should be established, and responsibilities for activities relating to quality system development assigned. As in the design of a construction project, resources need to be allocated, adequate time allowed, and a budget established to cover cost of developing the quality system.

Most design practices are capable of developing and implementing a quality system that meets the requirements of AS/NZS ISO 9001 without external assistance. However, there now exists a body of knowledge on how to structure and operate quality systems and on the form of documentation and records that are appropriate and generally acceptable to clients and external auditors. A design practice may be able to save time (and money) in developing and implementing a quality system by drawing on that body of knowledge.

3.3 DEVELOPING A QUALITY SYSTEM In developing a quality system, it will generally be worthwhile to proceed as follows:

- (a) Determine the practice's strategic goals, business objectives and the broad framework and scope of the quality system, as outlined in Clause 3.1 above.
- (b) Analyse how the practice currently manages its business. Think through the range of design and other services it offers, its products and outputs, the resources it employs, its assets and areas of expertise, its style of operations; and its major clients and potential clients, typical client needs, requirements and expectations.
- (c) List the main steps in providing these services, and the measures necessary to maintain control of all activities that affect the standard of work produced. Identify the checks and controls used, the things that can go wrong at each step and the essential records the practice keeps.
- (d) Having listed the main steps in the processes relating to the core activities of the practice in a logical process flow sequence, identify where these steps link to AS/NZS ISO 9001, using a matrix to identify relevant procedures and records. (Preparing a flowchart can assist in documenting the process flow sequence.)
- (e) The process steps should then be reviewed to identify risk factors and possible sources of variation; for example, engagement of new staff or subconsultants or introduction of new software programs may require additional control procedures.
- (f) Processes can then be documented in procedures which are intended to facilitate planning, coordination, allocation of responsibility and authority, development of resources and control of activities (refer to Clauses 2.4 and 2.5). It is often useful to involve various people within the practice in preparing this documentation, to spread ownership of the quality system.

3.4 IMPLEMENTING AND IMPROVING A QUALITY SYSTEM The quality system should be designed primarily to satisfy the management needs of the practice. It should be a formalization of the way management wants things to be done, and should be as comprehensive as will be needed to meet the objectives for quality.

All personnel should be trained in the operation of the quality system, and should be encouraged to comment on and improve the system.

It should be recognized that the introduction of a documented quality system may meet a degree of resistance or confusion as parts of the system are first brought into use. This can be reduced by measures such as involving personnel at all levels in preparing the documentation, and by implementing changes and new procedures progressively, to avoid disruption or 'culture shock'. For example, a new system or procedure could be trialed on a small project, or in a defined area of operation, then fine-tuned before releasing it for general use.

In order to be responsive to the needs of the practice, its personnel and its clients, the system should be set up to be flexible, and to facilitate improvements in the processes and methods which the practice applies to doing its work. These characteristics need to be planned and provided for when setting up the quality system, and when it is being reviewed and maintained.

Regular reviews of current and future suitability and effectiveness of the quality system should be carried out by senior management, e.g. at a partners' or directors' meeting (see Clause 4.1.3). These reviews should include the results of quality system audit, control of work which does not meet requirements, corrective and preventive action and feedback from clients.

Quality system audit (see Clause 4.17) should indicate where the system is working as planned, and identify any deficiencies. Deficiencies may require changes to the system, or additional staff training (see Clause 4.18) to ensure the system is used as planned.

Reviews of the control of work which did not meet requirements (see Clause 4.13) are to establish if the controls are effective, and to identify reasons and trends (see also Clause 4.20, Statistical techniques).

Corrective action procedures should rectify the causes of identified quality system problems, and preventive action procedures should address potential problems (see Clause 4.14).

Reviews of the quality system provide opportunities for improvement, and should include planning for future development of the system to ensure continuing suitability (particularly where changing circumstances are predicted).

Experiences gained on projects can be captured and evaluated with the assistance of the quality system, then used to identify opportunities for improvement in procedures. In addition, all staff should be encouraged to contribute to the improvement process, by identifying potential deficiencies in procedures or smarter ways of doing work. Guidance on these mechanisms for improvements are given in Section 4.

NOTE: The Plan–Do–Check–Act cycle provides a model for continuous improvement (see Clause 2.3).

The ultimate test (and demonstration) of the commitment of senior management to the quality management system is how strongly they drive the continuous improvement process to increase the efficiency and effectiveness of their system.

SECTION 4 COMMENTARY ON QUALITY SYSTEM REQUIREMENTS

4.0 INTRODUCTION This Section provides guidance on the relevance and application of each of the clauses of Section 4 of AS/NZS ISO 9001 to architectural and engineering design practices.

All the requirements of AS/NZS ISO 9001 should be considered in developing, implementing and auditing a quality system, however some may be not applicable.

Although commentary is set out on a clause-by-clause basis, it is not necessary for the quality system and documentation to be structured in the same order as Section 4.

As noted in the general guidance on documenting quality systems provided in Clause 2.5, the quality system and documentation should be structured in a manner the practice considers to be the most useable. One procedure may cover several of the Clauses of AS/NZS ISO 9001, or a requirement may be addressed in several different procedures. The level of detail needed in documented procedures also varies; for example, less detail would be required where personnel are highly trained, experienced, and competent.

As described in Clause 2.4, the Standard emphasizes that planning is an essential element of a quality management system, and further guidance is provided in Section 3, Clauses 4.2.3, 4.4.2 and 4.9, and Appendix B.

General guidance on quality management is provided in AS/NZS ISO 9004.1, including general guidance on quality management and design control in Clause 8, Quality in specification and design.

Design control can also apply to the design of the range of services that a practice may offer. For a design practice engaged in repetitive commissions, design of service may be a once-only activity, and may have been done in the past and been validated by experience. For further advice on design of services, refer to AS 3904.2/NZS 9004.2.

Only limited guidance is provided on other associated services which a design practice may offer, such as site investigation, project management and site services. For further guidance on such services reference should also be made to AS/NZS 3905.2, which provides guidelines for construction projects and associated services, and includes guidance on calling up quality assurance requirements in project documentation.

4.1 Management responsibility**4.1.1 Quality policy**

The supplier's management with executive responsibility shall define and document its policy for quality, including objectives for quality and its commitment to quality. The quality policy shall be relevant to the supplier's organizational goals and the expectations and needs of its customers. The supplier shall ensure that this policy is understood, implemented and maintained at all levels of the organization.

Guidance

A quality policy statement is required which should express the design practice's overall quality intentions and organizational goals. It should also provide the link to business objectives and marketing strategies. It would normally state policies covering:

- (a) Commitment to ascertaining and meeting client needs and expectations.
- (b) Scope of the quality system's application within the practice.
- (c) Management's expectations of staff.
- (d) The general approach to achieving these objectives.

The quality policy should not overstate or misrepresent the practice's capability. It should present realistic objectives, and would usually be authorized by the chief executive or senior partner.

A practice's organizational goals related to quality could include:

- (i) Reduction in the incidence and cost of nonconformity.
- (ii) Effective handling of client complaints.
- (iii) Performance measures such as efficiency, effectiveness, profitability and client satisfaction.
- (iv) Achieving and maintaining quality system certification.

As noted in Clause 2.2, a strong and visible commitment by management is a characteristic of effective quality management systems.

Goals such as understanding and implementation of quality policy and objectives by staff are usually achieved through induction and training.

4.1.2 Organization**4.1.2.1 Responsibility and authority**

The responsibility, authority and the interrelation of personnel who manage, perform and verify work affecting quality shall be defined and documented, particularly for personnel who need the organizational freedom and authority to:

- a) initiate action to prevent the occurrence of any nonconformities relating to the product, process and quality system;
- b) identify and record any problems relating to the product, process and quality system;
- c) initiate, recommend or provide solutions through designated channels;
- d) verify the implementation of solutions;
- e) control further processing, delivery or installation of nonconforming product until the deficiency or unsatisfactory condition has been corrected.

4.1.2.2 Resources

The supplier shall identify resource requirements, provide adequate resources, including the assignment of trained personnel (see 4.18) for management, performance of work and verification activities including internal quality audits.

Guidance

Clear definition of responsibility, authority and lines of communication is essential. This requirement can be fulfilled by summaries of key positions which identify the management structure and record the responsibilities and authorities, e.g. in a simple organization chart, usually supplemented by a set of job or position descriptions setting out the roles and responsibilities for all key positions. The organization chart and position descriptions should be reviewed and updated regularly.

Management should identify the resources needed to carry out the work, and ensure that they are available. For example, when a proposal or tender is being prepared, or a commission or contract is being considered, personnel may have to be hired and trained, subconsultants engaged and new equipment purchased.

Resource requirements cover personnel, equipment, information, software and support services. A regular review of the resources required will enable forward planning and could be carried out in conjunction with the management review or contract review (see Clauses 4.1.3 and 4.3). Such reviews can include resources available from subcontractors such as subconsultants (see Clause 4.6.2).

For a practice involved in design, it is essential that competent personnel are available to perform the work. Experience with projects of a similar nature is an advantage, particularly during the planning and review steps. Records of staff qualifications, experience and training should provide some of the evidence needed to show that the practice has the capability and resources appropriate to the work it performs (see Clause 4.18).

4.1.2.3 Management representative

The supplier's management with executive responsibility shall appoint a member of the supplier's own management who, irrespective of other responsibilities, shall have defined authority for

- a) ensuring that a quality system is established, implemented and maintained in accordance with this International Standard, and
- b) reporting on the performance of the quality system to the supplier's management for review and as a basis for improvement of the quality system.

NOTE: 5 The responsibility of a management representative may also include liaison with external parties on matters relating to the supplier's quality system.

Guidance

A person involved in the management of the practice needs to be appointed to assume overall responsibility and authority for quality management, including implementation, operation and improvement of the practice's quality system. In order to exercise this authority effectively, this person needs a thorough understanding of the practice's business and operations, but can also have other responsibilities.

For a large practice there may also be a need to delegate responsibility to managers who would report to the corporate management representative, e.g. managers at branch or site offices.

Reports and advice from the management representative provide an important input to the process of management review (see Clause 4.1.3) and should be based on information and data gathered through the quality system as a basis for evaluating performance against objectives.

4.1.3 Management review

The supplier's management with executive responsibility shall review the quality system at defined intervals sufficient to ensure its continuing suitability and effectiveness in satisfying the requirements of this International Standard and the supplier's stated quality policy and objectives (see 4.1.1). Records of such reviews shall be maintained (see 4.16).

Guidance

Management reviews provide a strategic overview. They are different and separate from the internal quality audits referred to in Clause 4.17, although both management reviews and internal quality audits are concerned with the effectiveness of the quality system.

Management should consider the quality system's suitability and effectiveness in terms not only of ensuring product quality, but also of its contribution towards the achievement of business policies and objectives.

Management reviews must be performed by the executive management such as senior partners (i.e. by those directly responsible for the management of the practice and its quality system) not by some other person on its behalf. In most design practices, management review can be conducted effectively in a meeting, with the decisions and the actions taken recorded in the minutes.

The intervals at which management reviews of the quality system are conducted should be defined in the quality system documentation.

Once a system is operating smoothly and effectively, annual management reviews may be appropriate. However, management reviews may be more frequent (possibly monthly) during the implementation phase, or at other times, such as a change in key personnel or the nature of the practice, following a significant client complaint, or for specific projects.

The issues addressed in management reviews should include the following:

- (a) *Is the quality policy of the practice continuing to be relevant to management's organizational goals and the expectations and needs of the clients?*
- (b) *Is the policy well understood and being implemented effectively?*
- (c) *Is the practice's organization for quality and its allocation of responsibility and authority achieving its objectives?*
- (d) *Are the resources applied to the operation of the quality system adequate and appropriate?*
- (e) *Is the quality system efficient and cost-effective?*
- (f) *Are the procedures for preventive action effective (see 4.14.3)?*
- (g) *Were management's corrective actions on deficiencies found during internal and external audits timely and effective?*
- (h) *Are the requirements for training being adequately addressed?*
- (i) *Is the quality system organized to accommodate any planned or expected changes in the practice?*

Management reviews should focus on the overall suitability and effectiveness of the quality system and the consideration of ways to improve it. Also, Clause 4.17 notes that the results of internal quality audits form an integral part of the input to management review activities.

4.2 Quality system

4.2.1 General

The supplier shall establish, document and maintain a quality system as a means of ensuring that product conforms to specified requirements. The supplier shall prepare a quality manual covering the requirements of this International Standard. The quality manual shall include or make reference to the quality system procedures and outline the structure of the documentation used in the quality system.

NOTE 6 Guidance on quality manuals is given in ISO 10013.

4.2.2 Quality system procedures

The supplier shall

- a) prepare documented procedures consistent with the requirements of this International Standard and the supplier's stated quality policy, and
- b) effectively implement the quality system and its documented procedures.

For the purposes of this International Standard, the range and detail of the procedures that form part of the quality system shall be dependent upon the complexity of the work, the methods used, and the skills and training needed by personnel involved in carrying out the activity.

NOTE 7 Documented procedures may make reference to work instructions that define how an activity is performed.

Guidance

The quality system for a design practice is firstly the way it manages its operations and processes and controls the quality of its products, and secondly the documentation, procedures and records relating to this system. To meet the requirements of AS/NZS ISO 9001, the quality system must be documented, e.g. by electronic media or hard copy. Quality system documentation is often structured as follows:

- (a) *The quality policy statement* Clause 4.1.1 outlines the policy statement requirements.
- (b) *The quality manual* The quality manual is a document setting out in general terms the manner in which the requirements of AS/NZS ISO 9001 are met by a practice's quality system and procedures (see AS/NZS ISO 10013 for further guidance on quality manuals). The manual often contains the policy statement and may be written in a form suitable for issue to clients and potential clients.
- (c) *Documents setting out responsibilities, authorities and relationships affecting quality.*
- (d) *Procedures* Procedures are described as the 'specified way to perform an activity', i.e. how activities are carried out and controlled. They commonly relate to the main groups, activities and processes within the practice.
- (e) *Instructions* Instructions are documents setting out how one person is to undertake nominated activities of a procedure, and may include methods of implementation, forms to be used as quality records, etc.

NOTE: Procedures and instructions documents may contain confidential or commercially-sensitive information. Normally, they are not distributed outside the practice, but may need to be made available on a confidential basis to clients, or to auditors as part of the quality system documentation (see Clause 2.5).

- (f) *Other relevant documents* Documents such as practice notes, information referenced in procedures, and the like.