



**NATIONAL MODEL FOR STANDARD PRACTICE IN SURVEYING AND
MAPPING**

MODEL STATUS

The Model is in a framework form to allow incremental addition of detail.

Comments have been received to early drafts. Generally these have been supportive of the need for a National Model. The Institution of Surveyors Australia would like to see an increase in the scope of the Model to cover issues such as education, professional development and professional practice. The Institution also suggested the document outline national objectives in these areas. Comments from the Association of Consulting Surveyors Queensland recommend input from other bodies representing surveyors. The Surveyors Board of Queensland has suggested the Model be framed in broad principles, with necessary detail being included as guidelines. The Board commented that there was too much emphasis on cadastral survey standards, and reinforced the need to involve other survey bodies.

The Working Party has therefore:

- **Refocused on providing broad principles.**
- **Met the needs of the Reciprocating Boards by providing detailed cadastral survey guidelines in a separate document cross-referenced to the Model.**
- **Sought to encourage stakeholders to take the Model forward by nominating bodies to co-ordinate development of particular sections of the Model.**

1 INTRODUCTION

A key element of micro-economic reform in Australian and New Zealand is the removal of the barriers to the free flow of goods and services which may currently occur at jurisdictional boundaries. The objective is to create a common market place. This imperative is already being applied in areas such as mutual recognition of qualifications, the development of national land data transfer policies, and the phasing out of intra-jurisdictional preferences in the supply of goods and services. Similar reforms are being implemented in cross-Tasman trade with New Zealand.

The growth of a national marketplace is particularly evident in service industries such as surveying and related spatial information management. Within the industry, companies are being formed which frequently operate across jurisdictional borders; in some cases nationally. Similarly, a significant number of client companies are also nationally structured. It is apparent that an existing lack of uniformity in jurisdictional standards and practices, must represent an unnecessary impediment to the continuing growth and operational effectiveness of the national surveying and related land information industry.

The primary responsibility for the co-ordinated development and implementation of surveying policies and practices, is vested in three bodies; the Reciprocating Surveyors Boards of Australia and New Zealand; the Institution of Surveyors, Australia; and the Inter-Government Committee on Surveying and Mapping. Each of these bodies has independently recognised a growing need to facilitate the development and adoption of uniform surveying practices:

Council of the Reciprocating Surveyors Boards of Australia and New Zealand (CRSBANZ)



- The Reciprocating Surveyors Boards of Australia and New Zealand, at the 100th Anniversary Meeting in 1992 noted that, whilst mutual recognition of surveying qualifications had been in place since the inception of the Reciprocating Boards, there now exists a need to progress beyond common competency requirements and to pursue opportunities to achieve uniformity of survey practice and legislation between the States and Territories of Australia and New Zealand.
- The Institution of Surveyors, Australia, at its annual conference in 1992, also identified a need to develop and pursue the national adoption of common standards of surveying practice.
- The Inter-Governmental Committee of Surveying and Mapping (ICSM) is already actively involved in the development and implementation of common standards and guidelines in areas such as geodesy, topography and toponymy. It is also committed to the creation of a national spatial information infrastructure. A national practice model is an important enabling tool for the development of this infrastructure.

The Surveyors General/Chief Surveyor in each jurisdiction have a prime responsibility for survey practice standards. Their interest in developing common standards is reflected in their membership in all three national bodies.

On 6 August 1993, the Presidents and Chairman of the three national organisations agreed to jointly develop a draft national policy on the development, and subsequent adoption, of a national model for standard practices in surveying and related spatial information management. The draft was subsequently ratified. That policy is:

The Reciprocating Surveyors Boards of Australia and New Zealand, the Institution of Surveyors, Australia and the Inter-Governmental Committee on Surveying and Mapping: noting the need to encourage and facilitate the creation of a strong domestic and internationally competitive surveying and related spatial information industry in Australia and New Zealand; **recognising** the problems created by existing variations in surveying standards and practices between individual jurisdictions; and with the object of **encouraging and facilitating** the progressive adoption, as appropriate, of national standard practices and procedures; **will jointly develop and encourage the adoption of a national model of standard practices in surveying and related spatial information management.**

The model forms the framework for:

- cross referencing existing or proposed standards affecting surveying and mapping practice.
- providing a ready reference for practitioners to the body of pertinent standards.
- facilitating discussions on areas where standards are not yet developed.
- encouraging all jurisdictions when developing local legislation, procedures and documentation, to adopt uniform practices.
- developing guidelines on detailed aspects of surveying and mapping practice.



2 DEFINITIONS AND STANDARD TERMINOLOGY

This section will provide definitions of some key terms used in the model. Examples are:

- *surveying*
- *spatial*
- *cadastral*
- *geodesy*
- *fundamental spatial framework*

Existing glossaries containing relevant definitions will be cited or cross referenced as sources for further detail.

3 GENERAL PRINCIPLES

These are common elements of practice which are relevant to all areas of surveying and mapping. This section lists these common elements and references existing authorities or standards.

3.1 Quality Assurance

All systems, procedures and guidelines developed under this model should conform with quality assurance standards, contained in the appropriate national standard.

In the last five years a quality management revolution has occurred throughout the industry in Australia. This has seen the widespread adoption of the international standard for quality management systems. These standards are published in Australia and New Zealand as the AS/NZS/ISO 9000 series.

It is recommended that individual organisations seek quality accreditation.

3.2 Legal Traceability

All equipment used in relation to this model must undergo the appropriate calibration procedures and be used in such a way to meet the required measurement standards set out in this model. Any technology or equipment capable of meeting these standards can be used.

Calibration procedures laid down by Verifying Authorities (in most cases, the Surveyors General) shall be followed.

Preference should be given to using equipment manufactured in compliance with the appropriate Australian and International standards. Examples are Surveyors measuring bands (AS1297) and levelling staffs (AS1298). Total Stations, Levels etc. manufactured to ISO 9000.



3.3 Units of Measurement

Metric units stipulated in AS1000 shall be used. The Australian convention for radial measurement units is degrees, minutes and seconds of arc.

3.4 Co-ordinate Systems

The current three dimensional datums in standard use are the Australian Geodetic Datum and Australian Height Datum. Specification of these datums are contained in Special Publication (SP 1) of the National Mapping Council. Any co-ordinate systems which are used should be capable of being related to these datums.

ICSM has resolved that a geocentric datum will be developed to replace the existing Australian Geodetic Datum by the year 2000.

This datum is described officially in the Commonwealth Gazette No. GN35 of 6 September 1995.

3.5 Geodetic Network and Requirements to Connect Surveys

All surveys carried out under this model shall, wherever practicable, be related to the geodetic network. This shall be achieved by direct connection to official geodetic marks, or indirectly transferred from official geodetic marks through technologies such as remote sensing, photogrammetry or satellite ranging.

3.6 Marks and Marking

Stable marks of durability appropriate to the purpose of a survey shall be used.

3.7 Entry onto Property

Persons operating under this model may enter property to undertake measure tasks. The rights of the landholder or occupier will need to be respected. Notice of intention to enter land needs to be given.

3.8 Competency

Competencies required to undertake particular surveying or mapping tasks shall be determined by the appropriate Authority, or where there is no Authority, by a relevant industry body.

Persons with competencies appropriate to a task shall be used. Management practice including adequate supervision shall be put into place to ensure appropriate standards set out in this model are met.



3.9 Conduct

Persons operating under this model shall conform with:

- codes of ethics of relevant bodies
- legal responsibilities of Equal Employment Opportunity, anti-discrimination and Occupational Health and Safety.
- consumer legislation
- employment agreements/awards

3.10 Continuing Professional Development

Persons operating under this model will need to maintain their competency, preferably through a formal CPD program.

3.11 Co-ordination of Activities

Activities covered by this model must be co-ordinated at a jurisdictional and national level to eliminate wasteful duplication and ensure integration of information and systems.

3.12 Public Survey Registers

Each jurisdiction shall have a mechanism to report, record, obtain, manage and distribute survey and related information, to enable equitable and cost efficient access to measurement data for use by government, industry and the community.

3.13 Notice of Intention to Commence Survey

The Authority maintaining a public survey register may require that the intention to undertake a survey be reported.

3.14 Submission of Survey Data

The Authority maintaining a public survey register may require submission of survey data.

3.15 Liability and Indemnity

Persons operating under this model must be either insured or indemnified against liability.

3.16 Arbitration

To reduce the costs arising from litigation, each jurisdiction will provide a mechanism to resolve disputes arising from activities covered by this model.

Mechanisms include a panel of industry mediators, professional arbitrators or a standing tribunal.



4 SURVEY STANDARDS

This section contains modules which set out procedures and standards which will be used in particular surveying activities.

4.1 Geodetic Control Surveys

These surveys will be carried out in accordance with the ICSM Standards and Practices for Control Surveys (Special Publication SP1). SPI sets out:-

- *standards of accuracy of control surveys*
- *recommended survey and reduction practices*
- *recommended marking practices*
- *recommended documentation standards*

4.2 Cadastral Surveys for Boundary Definition and Adjudication

At present each jurisdiction has its own code of cadastral practice comprising technical standards and procedures. These codes are contained in legislation, survey practice regulations and procedural directions, notices and manuals.

Proposed National Guidelines are under preparation by the Reciprocating Boards of Australia and New Zealand, and will eventually be cross referenced in this sub-section.

4.3 Engineering and Construction Surveys

Development of this section needs to be co-ordinated (State Road Authorities?).

Relevance of AS2990 "Quality Systems for Engineering and Construction Projects" to be assessed. Starting points for expanding this section will be existing specifications used by construction authorities. Guidelines should address the following:

- *Survey Datum*
- *Measurement Accuracies*
- *Lower and Higher Precision Surveys*
- *Presentation Formats*
- *Minimum Marking Requirements*
- *Minimum Geodetic Connections*
- *Other requirements.*

4.4 Topographic Surveys

*Development of this section needs to be co-ordinated (AUSLIG?).
Existing: standards will be referenced.*

4.4.1 Ground Segment



4.4.2 Remote (Air) Segment

4.4.3 Presentation Formats

4.5 Hydrographic Surveys

Development of this section needs to be co-ordinated (Hydrographic Commission of ISA?). Existing international Hydrographic Organisation and Australian Standards will be referenced.

4.6 Mining Surveys

This sections needs to be co-ordinated (State Mining Authorities?). This section covers surveys for tenement boundaries and open cut and underground operation. To be formulated in consultation with subject matter experts. existing regulations and specifications will be referenced.

4.7 Other Measurement Tasks

This section is open ended and of lower priority at this stage.

4.7.1 Environmental Monitoring

4.7.2 Irrigation Surveys

5 ACQUISITION OF DATA FROM IMAGERY

Development of this section needs to be co-ordinated. NMC and other standards will be referenced.

6 MAPPING

Development of this section to be co-ordinated by ICSM. NMC and other standards will be referenced.

6.1 Data Collection Standards

6.2 Data Presentation Standards

6.3 Data Currency

6.4 Locational Reference Standards

6.5 Attribute and Classification Standards

7 GEOGRAPHICAL NAMES



*This section to be formulated by ICSM/CGNA.
Most guidelines already exist.*

7.1 National Toponymic Guidelines

7.2 Use of Indigenous Names

7.3 Recording Systems

8 DIGITAL DATA STANDARDS

This section will reference existing or emerging data standards, to be notified by ICSM.

8.1 Metadata Documentation

8.2 Data Transfer

8.3 Data Management

9 BUSINESS PRACTICES

Development of this section could be co-ordinated by ACSA.

As a statement of principle, relevant professional bodies such as ACSA have the responsibility for advising their members on business practice.

10 RECOMMENDED NATIONAL OBJECTIVES IN IMPLEMENTING THE MODEL

To be considered by all stakeholders, including but not limited to:

- *Boards*
- *ICSM*
- *Professional Bodies*

RESOLUTION

- *The National Model be adopted as Policy of the Reciprocating Boards; and*
- *Request ICSM to co-ordinate the development of the Model and draw up an implementation plan.*

**Launceston, Tasmania
12 November, 1998.**
