An Update on the Development of Standards and Practices for Control Surveys (SP1)

Permanent Committee on Geodesy (PCG)
Overview

• Brief history of SP1
• Version 2 review process
• Purpose and scope of SP1 – version 2
• Structure and content
• Implications for tenders and contracts
• Further development
• Questions
Brief History of SP1

• SP1 “Horizontal & vertical control surveys” originally published in 1966
• Reviewed 1976, 1981
• Extensively revised in 1986
• Current review (2009–2013):
  – Major structural change
  – Revision of standards and guidelines in light of technological advancements
  – Shift from CLASS and ORDER to uncertainty
  – Less prescription for survey practice guidelines
Version 2 Review Process

• Landgate (WA) review
• ICSM PCG review
• Selected stakeholder feedback
  – Private surveying organisations
  – Government surveying departments
  – Academia
• First public draft released for feedback (April – July 2012)
• Further PCG review based on feedback
• Current status:
  – Standard endorsed by ICSM November 2012
  – Guidelines presently under review
Purpose and Scope of SP1 version 2

• Specify minimum requirements
  – For the determination of 1D, 2D or 3D position and uncertainty of Australia’s survey control marks

• Promote the adoption of uniform procedures
  – To achieve the highest level of rigour and integrity in the establishment and maintenance of Australia’s survey control mark network

• Scope – surveys that define, improve, extend or connect to the network
  – Datum control surveys
  – General purpose control surveys
Structure and Content

• One over-arching standard

• Six guidelines
  – Control survey by GNSS
  – Control survey by conventional traverse surveys
  – Control survey by differential levelling
  – Continuously Operating Reference Stations (CORS)
  – Installation and documentation of survey control marks
  – Adjustment and testing
Structure and Content

Standard – SP1

- Adjustment Guideline
- GNSS Guideline
- Levelling Guideline
- Conventional Traverse Guideline
- Marks Guideline
- CORS Guideline
The Standard

• Terms and definitions
• Scope
  – Datum control surveys
  – General purpose control surveys
• Connection to datum
• Conducting control surveys (refer to guidelines)
• Quantifying survey quality
  – Survey Uncertainty (SU)
  – Positional Uncertainty (PU)
  – Relative Uncertainty (RU)
• Evaluating and expressing uncertainty
Control Survey Guidelines

• Control surveys by:
  – GNSS
  – Conventional traverse
  – Differential levelling

• Equipment

• Observation procedures

• Processing procedures (GNSS)

• Examples
CORS Guideline

• Tier hierarchy
• Network design
• Site establishment
• Equipment
• Coordination
• Operation
Survey Mark Guidelines

• Mark characteristics
  – Material, construction, penetration
  – Visibility, access, location, stability, etc.

• Mark information
  – Mark details
  – Sketch plans
  – Uncertainty
  – Measurement technique
Adjustment Guideline

• **Scope**

• **Connection to datum**

• **Adjustment of survey control**
  – **Purpose**
  – **Recommended procedure**

• **Testing uncertainty**
  – **Local test**
  – **Global test**

• **Example test procedure**
Implications for Users

• SP1 is intended to promote adoption of uniform procedures for both datum and general purpose control surveys

• Compliance with standard
  – Mandatory for government / private organisations undertaking datum control surveys
  – Not mandatory for organisations undertaking general purpose control surveys

• Compliance with guidelines
  – Not mandatory unless referred to by legislation, government policy, directions, contract specifications, etc.
Further Development

Standard – SP1

- Adjustment Guideline
- GNSS Guideline
- Levelling Guideline
- Conventional Traverse Guideline
- Marks Guideline
- CORS Guideline
Further Development

Standard – SP1

- Adjustment Guideline
- GNSS Guideline
- Levelling Guideline
- Conventional Traverse Guideline
- Marks Guideline
- CORS Guideline
- New Guideline

- State-Specific Guideline
- Specialised Guideline
- State-Specific Guideline
Latest version and Feedback

• For the latest version, see:

• Please submit feedback to:
  icsm@ga.gov.au