



**Australian Government**

# **CPPSIS5054 Perform geodetic surveying computations**

**Release: 1**

# CPPSIS5054 Perform geodetic surveying computations

## Modification History

Release 1.

Replaces superseded equivalent CPPSIS5054A Perform geodetic surveying computations.

This version first released with CPP Property Services Training Package Version 3.

## Application

This unit of competency specifies the outcomes required to perform geodetic surveying computations to solve a range of geodetic surveying problems. The unit covers applying mathematical concepts and formulas to geodetic components and performing computations relating to reference surfaces and projection planes. It covers using techniques for data reduction and checking data. It requires the ability to analyse data to comply with standards, and to consult with others to clarify and report on work tasks.

The unit supports those who work under limited supervision in a surveying team.

No licensing, legislative, regulatory, or certification requirements apply to this unit of competency at the time of endorsement.

## Pre-requisite Unit

Nil

## Unit Sector

Surveying and spatial information services

## Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions.

- |                                                 |                                                                                                                                              |
|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Prepare for geodetic surveying computations. | 1.1. Task requirements are identified and required geodetic computations determined in consultation with <b><i>appropriate persons</i></b> . |
|                                                 | 1.2. Industry-accepted standards relating to accuracy and tolerances are identified according to organisational requirements.                |
|                                                 | 1.3. Computational equipment is selected according to task and organisational requirements.                                                  |

- |    |                                            |      |                                                                                                                                      |
|----|--------------------------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------|
| 2. | Perform computations on reference surface. | 2.1. | Relevant reference surface is selected according to required geodetic computations.                                                  |
|    |                                            | 2.2. | Geodetic data is reduced to identified reference surface according to industry-accepted standards and using computational equipment. |
|    |                                            | 2.3. | Geodetic components for reference surface are identified and computed according to industry-accepted standards.                      |
|    |                                            | 2.4. | Computations on reference surface are identified and performed according to standards.                                               |
|    |                                            | 2.5. | Reference surface computations are checked and problems resolved according to standards and organisational requirements.             |
|    |                                            | 2.6. | Reference surface (spheroid) coordinates are converted to projection plane coordinates according to standards.                       |
|    |                                            |      |                                                                                                                                      |
| 3. | Perform computations on projection plane.  | 3.1. | Relevant projection plane is selected according to required geodetic computations.                                                   |
|    |                                            | 3.2. | Data is reduced to required projection plane according to standards.                                                                 |
|    |                                            | 3.3. | Geodetic components for projection plane are identified and computed according to standards.                                         |
|    |                                            | 3.4. | Projection plane coordinates are converted to reference surface (spheroid) coordinates according to standards.                       |

## Foundation Skills

This section describes the language, literacy, numeracy and employment skills essential to performance in this unit but not explicit in the performance criteria.

### Skill

### Performance feature

Numeracy skills to: • perform calculations relating to shape and size of the earth.

Oral communication skills to:

- ask questions to clarify client requirements.

Reading skills to:

- interpret complex computational data provided in diagrammatic form.

Writing skills to:

- record technical information in organisational documentation.

Technology skills to:

- use computing aids, including geodetic software.

## Range of Conditions

This section specifies work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included. Bold italicised wording, if used in the performance criteria, is detailed below.

***Appropriate persons*** must include at least one of the following:

- client
- colleague
- end user
- manager
- registered or qualified surveyor.

## Unit Mapping Information

CPPSIS5054A Perform geodetic surveying computations

## Links

Companion Volume implementation guides are found in VETNet -  
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=6f3f9672-30e8-4835-b348-205dfcf13d9b>

# Assessment Requirements for CPPSIS5054 Perform geodetic surveying computations

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## Performance Evidence

A person demonstrating competency in this unit must satisfy the requirements of the elements, performance criteria, foundation skills and range of conditions of this unit. The person must also accurately perform geodetic surveying computations for two different surveying tasks.

While performing the above geodetic surveying computations, the person must:

- apply formulas to geodetic data and obtain correct results
- communicate clearly with others to clarify work tasks
- comply with organisational requirements and relevant standards essential to accuracy of:
  - calculating geodetic data
  - recording computations
- exercise precision and accuracy in geodetic computations
- perform calculations in a logical progression to solve geodetic surveying problems
- perform point to point calculations on:
  - projection plane
  - spheroid
- relate reference surfaces to geodetic components
- check accuracy of computations and resolve errors
- select and use the following computational equipment to perform geodetic surveying computations: scientific or programmable calculator or a software application that includes surveying calculations
- comply with organisational requirements relating to completing records and documentation.

## Knowledge Evidence

A person demonstrating competency in this unit must demonstrate knowledge of:

- industry-accepted standards relating to accuracy and precision for geodetic surveying data
- common terms used in geodetic surveying calculations
- computing aids and software used to perform geodetic computations
- data reduction techniques
- industry-accepted methods for validating data to identify errors and discrepancies

- methods to perform projection plane computations relating to the following:
  - angle or bearing calculations on Map Grid of Australia (MGA)
  - arc to chord corrections
  - grid bearings
  - grid convergence
  - latitude and longitude to grid coordinates
  - point and line scale factor
  - point to point calculations
  - project zone calculations
  - transforming coordinate axes
  - using MGA and Geocentric Datum of Australia software
  - zone to zone transformations
- methods to perform reference surface computations relating to the following:
  - meridian convergence
  - point to point calculations
  - principle radii
  - spheroidal distance from observed distance.

## Assessment Conditions

The following must be present and available to learners during assessment activities:

- equipment:
  - as specified in the performance evidence
- specifications:
  - task requirements
- relationships with team members and supervisor:
  - working in a team.

Timeframe:

- as specified by task and organisational requirements.

### Assessor requirements

As a minimum, assessors must satisfy the assessor requirements in the Standards for Registered Training Organisations (RTOs) current at the time of assessment.

## Links

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