



Australian Government

CPPSIS5053 Perform advanced surveying computations

Release: 1

CPPSIS5053 Perform advanced surveying computations

Modification History

Release 1.

Replaces superseded equivalent CPPSIS5053A Perform advanced surveying computations.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 advanced surveying computations to solve from a range of surveying and basic engineering-related problems. The unit covers applying mathematical concepts, computations and conversions relating to algebra, statistics, geometry and trigonometry. It also covers solving a range of surveying problems to identify errors and missing elements, and make necessary adjustments to computations. It requires the ability to analyse and evaluate spatial data as the basis for performing computations.

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 surveying computations.

- 1.1. Task requirements are identified in consultation with ***appropriate persons***.
- 1.2. Standards in relation to accuracy and tolerances are identified according to organisational requirements.
- 1.3. Computational equipment is selected according to task and organisational requirements.

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| 2. | Solve advanced computation problems. | 2.1. | Computations are performed on the coordinates of a traverse using computational equipment, and missing elements and coordinates are adjusted and computed. |
| | | 2.2. | Traverse information is reduced according to standards and task requirements. |
| | | 2.3. | Problems involving linear figures of parallel, constant or different width are identified and solved according to standards. |
| | | 2.4. | Road intersections involving different road widths are solved according to standards. |
| | | 2.5. | Computations are performed to maintain areas of closed figures according to industry-accepted standards. |
| | | 2.6. | Computations are performed on all elements of complex circular and reverse curves, and missing elements are solved according to industry-accepted standards. |
| 3. | Finalise computations. | 3.1. | Measurements and computations are checked to ensure accuracy according to industry-accepted standards and task requirements, and are adjusted as required. |
| | | 3.2. | Computations are finalised and recorded according to organisational requirements. |

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:	• apply the principles of algebra, geometry and trigonometry to calculate area, height and missing lines • calculate linear, angular and height measurements.
Oral communication skills to:	• ask questions to clarify work task requirements and computational formulas

- discuss solutions to advanced computational problems.
- Reading skills to:
- interpret complex computational data provided in diagrammatic form.
- Writing skills to:
- record computations and results using industry-accepted templates and formats.
- Problem-solving skills to:
- identify errors with computational results by applying rigorous checking procedures.

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
 - experienced surveying colleague
 - manager
 - qualified surveyor.

Unit Mapping Information

CPPSIS5053A Perform advanced 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 CPPSIS5053 Perform advanced 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 advanced computations for two different surveying tasks.

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

- communicate clearly with others to clarify work tasks
- comply with organisational requirements and relevant standards essential to the accuracy of:
 - measurement, including circular geometry and trigonometry
 - calculating horizontal and vertical information
 - recorded computations
- exercise precision and accuracy in performing advanced surveying computations
- interpret statistics from adjustments relating to normal curve and distributions, and standard deviations and errors
- select and use the computational equipment specified in the assessment conditions, to perform advanced surveying computations
- solve computational problems relating to angular, linear and height observations
- transform east and north coordinates from one system to another
- check accuracy of computations and make necessary adjustments
- 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 tolerances for surveying computations
- methods for performing the following:
 - computing data from supplied field information
 - solving complex surveying computations
 - checking accuracy of computations to identify errors and solve problems
- organisational policies and guidelines relating to completing records and documentation.

Assessment Conditions

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

- equipment:
 - scientific or programmable calculator or a software application that includes surveying calculations
- 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.

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