



Australian Government

CPPSSI5053 Perform complex surveying computations

Release: 1

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Modification History

Release 1 This version first released with CPP Property Services Training Package Release 12.0.

This unit supersedes and is equivalent to CPPSIS5053 Perform advanced surveying computations.

Application

This unit specifies the skills and knowledge required to perform advanced surveying computations to solve a range of surveying and simple engineering-related problems. It includes the application of mathematical concepts, computations and conversions relating to algebra, statistics, geometry and trigonometry. The unit also includes identifying errors and missing elements. It includes developing appropriate *a priori* and *a posteriori* uncertainty values to support compliance with surveying industry standards.

This unit is suitable for skilled surveying technicians and skilled spatial information system (SIS) technicians who use a broad range of cognitive, technical and communication skills to select and apply methods and technologies to analyse information and provide solutions to sometimes complex surveying/spatial information problems.

Surveying and spatial information skills are applied in a range of industry contexts, including town planning, civil construction, mining, engineering, health, agriculture and defence.

All work must be carried out to comply with workplace procedures, in accordance with relevant State/territory regulations that govern surveying work, as well as work health and safety (WHS) legislation and regulations that apply to the workplace.

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

Pre-requisite Unit

Nil.

Unit Sector

Surveying and Spatial Information Services

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe what needs to be done to demonstrate achievement of the element.

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| 1 Prepare for surveying computations. | 1.1 Identify task requirements in consultation with appropriate persons. |
| | 1.2 Identify requirements for accuracy and tolerances according to industry-accepted practices. |
| | 1.3 Select computational equipment to perform advanced surveying computations according to task and organisational requirements. |
| 2 Solve advanced computation problems. | 2.1 Compute the coordinates of a traverse and adjust and compute missing elements and coordinates. |
| | 2.2 Reduce traverse information and simplify to requirements for single horizontal and vertical angle. |
| | 2.3 Identify and solve problems involving linear figures of parallel, constant or different width according to standards. |
| | 2.4 Solve road intersection problems by calculating the bearing and distance from a relevant point with different road widths according to requirements. |
| | 2.5 Perform computations to maintain areas of closed figures according to industry-accepted standards. |
| | 2.6 Research and use equipment accuracy information in uncertainty calculations. |
| | 2.7 Calculate <i>a priori</i> and <i>a posteriori</i> uncertainty values to demonstrate compliance of data with industry-accepted standards. |
| | 2.8 Perform computations on all elements of complex circular and reverse curves and solve missing elements by checking for precision and accuracy according to organisational requirements. |
| 3 Finalise computations. | 3.1 Apply rigorous checking procedures to identify errors in computational results. |
| | 3.2 Adjust checked measurements and computations as required according to industry-accepted standards and task requirements. |

- 3.3 Finalise and record computations using industry-accepted templates and formats according to organisational requirements.

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Unit Mapping Information

Supersedes and is equivalent to CPPSIS5053 Perform advanced surveying computations.

Links

Companion volumes to this training package are available at the VETNet website - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=6f3f9672-30e8-4835-b348-205dfcf13d9b>

Assessment Requirements for CPPSSI5053 Perform complex surveying computations

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Performance Evidence

To demonstrate competency a candidate must meet the elements and performance criteria of this unit by accurately performing and recording complex computations required in surveying practice.

Candidates must:

- perform two complex measurements for using circular geometry and trigonometry
- interpret statistics from two adjustments relating to normal curve and distributions, and standard deviations and errors
- solve two computational problems relating to angular, linear and height observations
- perform two transformations for east and north coordinates from one system to another.

Knowledge Evidence

To be competent in this unit a candidate must demonstrate knowledge of:

- principles of algebra, geometry and trigonometry to calculate area, height and missing lines
- features of complex computational data provided in diagrammatic form
- industry-accepted standards relating to accuracy and tolerances for surveying computations
- methods for:
 - calculating linear, angular and height measurements
 - computing data from supplied field information
 - checking accuracy of computations to identify errors and solve problems
- organisational guidelines relating to completing records and documentation.

Assessment Conditions

Assessors must satisfy the requirements for assessors contained in the Standards for Registered Training Organisations.

Competency is to be assessed in the workplace or a simulated environment that accurately reflects performance in a real workplace setting where these skills and knowledge would be performed.

Candidates must have access to:

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

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