



Australian Government

CPPSIS6036 Monitor engineering structures

Release: 1

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Modification History

Release 1.

Replaces superseded equivalent CPPSIS6036A Monitor complex engineering surveying structures.

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

Application

This unit of competency specifies the outcomes required to monitor engineering structures using surveying methods. The unit covers analysing project specifications and design information to identify components to be measured and monitored, and planning monitoring activities. The unit also covers implementing project management mechanisms, including risk management, and reviewing work outcomes against specifications. It covers setting up and using surveying equipment to measure, record and reduce surveying data using spatial coordinate and reference systems. The unit requires the ability to validate the accuracy of data, and identify and resolve discrepancies and non-conformities between specifications and activities.

The unit supports those who work in a technical management role 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.

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| 1. Prepare to monitor engineering structure. | 1.1. Project specifications and engineering design information are interpreted to identify components to be measured, and accuracy and precision tolerances to be applied in consultation with <i>appropriate persons</i> . |
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- 1.2. Characteristics of operating environment and any special equipment and resource requirements are identified according to project specifications and organisational requirements.
 - 1.3. Equipment to be used to collect data is selected and checked to ensure correct operation and functionality according to manufacturer specifications.
 - 1.4. Organisation of project resources, equipment, materials and transport is designated to appropriate persons.
2. Develop project plan to monitor engineering structure.
 - 2.1. Project objectives, deliverables, constraints and principal work activities are documented according to project specifications.
 - 2.2. Information is included in project plan relating to identified risks and contingencies, resources, technologies and techniques to be used to collect spatial data.
 - 2.3. Validation processes to verify integrity of required spatial data are devised and specified in project plan.
 - 2.4. Work responsibilities are allocated and supervisory processes, checks and measures are implemented.
3. Implement monitoring tasks.
 - 3.1. Project management mechanisms are implemented to schedule, measure, record and report progress of activities in relation to project plan.
 - 3.2. Risk management and contingency strategies are devised and followed to identify and control hazards and risks, and ensure that monitoring activities comply with legal and statutory requirements.
 - 3.3. Surveying equipment is used to measure identified spatial components according to project specifications.
 - 3.4. Measured spatial data is reduced to project spatial reference system for comparison with design.
 - 3.5. Measurements are validated, recorded and processed according to project specifications.

- 3.6. Non-conformities between engineering structure and project specifications are identified and resolved, or contingencies are managed according to organisational requirements.
4. Finalise and report monitoring results.
 - 4.1. Monitoring is finalised and results are checked for compliance with project specifications and organisational requirements.
 - 4.2. Appropriate persons are notified of monitoring results according to organisational requirements.
 - 4.3. Documentation is completed and spatial data archived according to project and organisational requirements.
 - 4.4. Monitoring results are reviewed against project specifications and findings are reported to appropriate persons 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
Planning and organising skills to:	• prioritise work to meet contract and resource requirements and constraints.
Numeracy skills to:	• apply accuracy and precision tolerances to measurements and calculations • conduct precise measurements and calculations relating to height, depth, dimension, direction and position in actual operational activity and virtual representation.
Oral communication skills to:	• negotiate to meet client requirements • inform clients and other stakeholders of project progress.
Reading skills to:	• analyse graphical and technical information in engineering plans.

- Writing skills to:
- record technical information in organisational documentation.
- Technology skills to:
- connect equipment to coordinate systems
 - set up and calibrate surveying equipment.
- Problem-solving skills to:
- select appropriate validation methods to verify accuracy of data.

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 two of the following:
- client
 - colleague
 - end user
 - engineer
 - manager
 - registered or qualified surveyor
 - stakeholder
 - supplier.

Unit Mapping Information

CPPSIS6036A Monitor complex engineering surveying structures

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 CPPSIS6036 Monitor engineering structures

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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 monitor engineering structures for two projects.

While monitoring the above engineering structures, the person must:

- analyse surveying specifications, including:
 - cross-sections and plans
 - technical descriptions of surveying data and their collection and format requirements
- apply industry-accepted standards for performing surveying measurements and computations
- communicate clearly with others to clarify and report work information and negotiate task completion
- comply with industry-accepted standards for validating accuracy of surveying data and identifying errors and discrepancies
- comply with organisational, legal and statutory requirements for:
 - completing records and documentation
 - recording, storing and filing data
 - using, checking and storing surveying equipment
 - working safely and using personal protective equipment (PPE)
- conduct measurements and calculations to meet engineering specifications using two of the following pieces of surveying equipment:
 - current meter
 - global navigation satellite system (GNSS)
 - level
 - tape
 - theodolite
 - total station
- develop a project plan to monitor engineering structures, including detail of:
 - project objectives and deliverables
 - constraints

- risk management and contingency strategies
- work activities
- technologies and techniques to be used
- identify site hazards and control risks
- implement project management mechanisms to ensure monitoring activities are completed within required timeframes and comply with specifications
- interpret engineering design information and specifications to identify components to be measured and accuracy and precision tolerances to be applied
- plan and document data collection methodologies that allow for contingencies
- review project outcomes against specifications and objectives
- schedule work tasks and organise resources and equipment
- supervise staff to complete work tasks on time.

Knowledge Evidence

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

- accuracy and precision requirements and tolerances for engineering structures
- data formatting, processing and reduction techniques
- industry-accepted methods for validating data to identify errors and discrepancies
- legislative, statutory and industry requirements, and standards relating to work tasks
- methods for calculating surveying data and verifying its accuracy using spatial reference systems
- methods for setting up, levelling and calibrating surveying equipment
- methods for identifying and reporting non-conformities
- organisational policies and procedures relating to:
 - health and safety relating to survey activities and work on construction sites
 - reporting and documentation
 - using and allocating resources
 - using the surveying equipment specified in the performance evidence
- processes to establish and use high-level survey control
- project management techniques for scheduling, measuring and monitoring work progress and planning for contingencies
- project zone design
- reference and coordinate systems for surveying data, including Australian Height Datum and Map Grid of Australia
- surveying data capture and set-out methodologies
- use and application of network and traverse adjustments.

Assessment Conditions

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

- equipment:

- as specified in the performance evidence
- specifications:
 - survey specifications, including relevant engineering plans and drawings
 - organisational policies, procedures and documentation relating to work health and safety
- relationships with team members and supervisor:
 - lead role in a team.

Timeframe:

- as specified by project 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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