



Australian Government

CPPSIS6028A Conduct design and set out survey

Release 1

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Modification History

Unit revised and not equivalent to CPPSIS6008A Conduct design and set out survey
Element structure, performance criteria, and critical aspects reviewed to reflect workplace requirements
Skills and knowledge requirements and the range statement updated

Unit Descriptor

This unit of competency specifies the outcomes required for design and set out of roads and associated engineering structures. It requires the ability to undertake all aspects of survey design from understanding client and registered surveyor requirements and the special characteristics of a given site, to applying relevant legal and statutory requirements to the design. The selection of appropriate equipment, procedures and personnel is essential to performing the task safely and efficiently. Functions will entail complying with and developing or amending organisational guidelines.

Application of the Unit

This unit of competency supports the application of planning, organisational, communication, sound problem-solving and accuracy skills; error analysis; designing and interpreting technical documentation; and high-level understanding of technology for design purposes. The skills and knowledge acquired upon completion of this unit would support the needs of employees in surveying.

Licensing/Regulatory Information

Licensing, legislative, regulatory and certification requirements may impact on this unit. Incorporate these requirements according to state, territory and federal legislation.

Pre-Requisites

Nil

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the required performance needed to demonstrate achievement of the element. Where ***bold italicised*** text is used, further information is detailed in the required skills and knowledge and/or the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

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|---|---------------------------|--|
| 1 | Organise resources. | <p>1.1 Characteristics of the operating environment and any special equipment or resource requirements are identified according to <i>organisational guidelines</i>.</p> <p>1.2 Equipment is checked to be in good working order.</p> <p>1.3 <i>Manufacturer specifications</i> with regard to the use of equipment are complied with.</p> |
| 2 | Develop the project plan. | <p>2.1 <i>Objectives, principal work activities</i> and <i>constraints</i> are defined and documented according to written survey specifications and <i>client requirements</i>.</p> <p>2.2 Objectives and principal work activities are communicated to <i>relevant personnel</i>.</p> <p>2.3 Details of instruments and basic <i>techniques</i> to be used are considered and evaluated.</p> <p>2.4 Data is collected according to the <i>nature of the project</i> and organisational guidelines.</p> |
| 3 | Conduct the design. | <p>3.1 <i>Design</i> is interpreted to identify <i>surveying data components</i> to be measured or set out.</p> <p>3.2 <i>Hazards</i> and risks in the work site are identified, reported or rectified according to <i>OHS</i> procedures, <i>legislative requirements</i> and organisational guidelines.</p> <p>3.3 Pertinent <i>legal and statutory standards</i> are considered and adhered to.</p> |

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| | | 3.4 | Resources, equipment, materials and transport are determined and organised according to nature of the project. |
| | | 3.5 | Feedback provided by team members is discussed and acted upon in line with organisational guidelines. |
| 4 | Conduct set out survey. | 4.1 | Identified survey components are measured or set out. |
| | | 4.2 | Measured or set out survey data is reduced to the project reference system for comparison with design. |
| | | 4.3 | Impact of contingencies is managed. |
| | | 4.4 | Measured or set out data is validated and recorded according to specifications . |
| 5 | Complete project to clients' requirements. | 5.1 | Completed work is checked against clients' requirements according to the specifications. |
| | | 5.2 | Required documentation is completed according to organisational guidelines. |
| | | 5.3 | Relevant personnel are informed of the results according to organisational guidelines. |
| | | 5.4 | Survey data is archived according to project specifications. |

Required Skills and Knowledge

This section describes the essential skills and knowledge and their level, required for this unit.

Required skills

- communication skills to:
 - consult effectively with clients and colleagues
 - impart knowledge and ideas through oral, written and visual means
- initiative and enterprise skills to:
 - translate requirements into design
- literacy skills to:
 - assess, develop and use workplace information
 - prepare and manage documentation and information flow
 - read and write key performance reports, including technical reports
 - research and evaluate
- numeracy skills to:
 - analyse errors
 - conduct image analysis
 - estimate costs
 - interpret and analyse statistics
 - perform mental calculations
 - record with accuracy and precision
 - undertake high level computations
- organisational skills to:
 - plan and coordinate technical and human resource inputs to research activities
 - plan and prioritise activities to meet contractual requirements
- spatial skills to:
 - exercise precision and accuracy in relation to spatial and aspatial data design
 - archive and retrieve spatial data
 - manage and manipulate spatial data
 - manage files
 - solve problems relating to height, depth, breadth, dimension, direction and position in actual operational activity and virtual representation
- technology skills to:
 - use computers to develop survey documentation
 - use instruments when conducting design and set out surveys

Required knowledge

- advanced data reduction
- calibration of specialised surveying equipment
- data formats
- high-level, relevant engineering-related tasks and associated computations
- human resource management
- industry standards
- limitations of equipment
- organisational policies and guidelines, such as OHS guidelines
- planning and control processes
- road alignment design or stormwater system and associated computations
- safe work practices
- surveying reference systems
- surveying data capture and data set out methodologies
- understanding of errors, accuracy and precision in design

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, the range statement and the Assessment Guidelines for this Training Package.

Overview of assessment	This unit of competency could be assessed on its own or in combination with other units relevant to the job function, for example CPPSIS6035A Conduct complex engineering set out surveys.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	A person who demonstrates competency in this unit must be able to provide evidence of: • accessing and interpreting design information to identify the components to be measured and monitored • performing measurements • planning resources • reducing and manipulating survey • recording and reporting non-conformity aspects • knowledge of surveying reference systems, data capture and data set out methodologies.
Specific resources for assessment	Resource implications for assessment include access to: • assessment instruments, including personal planner and assessment record book • assignment instructions, work plans and schedules, policy documents and duty statements • registered training provider of assessment services • relevant guidelines, regulations and codes of practice • suitable venue and equipment. Access must be provided to appropriate learning and assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.
Context of assessment	Holistic: based on the performance criteria, evidence guide, range statement, and required skills and knowledge.
Method of assessment	Demonstrated over a period of time and observed by the assessor (or assessment team working together to conduct the assessment). Demonstrated competency in a range of situations, that may include customer/workplace interruptions and involvement in related activities normally experienced in the workplace. Obtained by observing activities in the field and reviewing induction information. If this is not practicable, observation

in realistic simulated environments may be substituted.

Guidance information for assessment

Assessment requires that the clients' objectives and industry expectations are met. If the clients' objectives are narrowly defined or not representative of industry needs, it may be necessary to refer to portfolio case studies of a variety of surveying and spatial information services requirements to assess competency.

Oral questioning or written assessment and hypothetical situations (scenarios) may be used to assess underpinning knowledge (in assessment situations where the candidate is offered a preference between oral questioning or written assessment, questions are to be identical).

Supplementary evidence may be obtained from relevant authenticated correspondence from existing supervisors, team leaders or specialist training staff.

All practical demonstration must adhere to the safety and environmental regulations relevant to each State or Territory.

Where assessment is for the purpose of recognition (recognition of current competencies [RCC] or recognition of prior learning [RPL]), the evidence provided will need to be authenticated and show that it represents competency demonstrated over a period of time.

In all cases where practical assessment is used it will be combined with targeted questioning to assess the underpinning knowledge.

Assessment processes will be appropriate to the language and literacy levels of the candidate and any cultural issues that may affect responses to the questions, and will reflect the requirements of the competency and the work being performed.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. ***Bold italicised*** wording in the performance criteria is detailed below. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

Organisational guidelines may include:

- appropriate timelines
- code of ethics
- company policy
- final product formats

- formal design parameters
- legislation relevant to the work or service function
- manuals
- OHS policies and procedures
- personnel practices and guidelines outlining teamwork, work roles and responsibilities
- requirements for data processing.

- Manufacturer specifications** may include:
- equipment specifications
 - operator manuals.
- Objectives** may include:
- agreed client requirements
 - written survey specifications.
- Principal work activities** may include the survey design of:
- bridge construction
 - building construction (domestic and commercial)
 - railway construction
 - road construction
 - sewerage system
 - stormwater system.
- Constraints** may include:
- coverage
 - datum
 - environmental factors
 - industry requirements
 - legal and statutory
 - financial
 - resource availability
 - time.
- Client requirements** refer to description of outputs and may be contained in:
- contracts
 - memos
 - tender briefs
 - verbal instructions
 - written instructions.
- Relevant personnel** may include:
- colleagues
 - registered surveyors
 - site personnel
 - staff or employee representatives
 - supervisors or line managers
 - suppliers
 - users.
- Techniques** may include:
- field
 - office procedures.
- Nature of the project** may include:
- bridge
 - building
 - railway
 - road
 - sewerage system
 - stormwater system.
- Design** may include:
- digital information
 - hard copy plans

- maps
- written instructions.

Surveying data**components** may include:

- depth
- dimension
- direction
- flow rates
- position
- slope.

Hazards may include:

- bites and stings
- broken glass and other sharp surfaces
- damaged or inappropriate equipment
- dust and fibres
- electrical problems arising from cables, electrical fittings (switches and lights) and untested electrical equipment
- environmental impact
- extremes of heat and temperature
- fatigue
- fire
- gas
- heights
- awkward and repetitive postures
- mobile vehicle problems around plant and vehicles
- moving and unguarded machinery and equipment
- noise
- occupational violence and bullying
- poor manual handling techniques
- poor personal hygiene practices
- repetitive motion, force and vibration
- syringes or other sharp objects
- ultraviolet light
- underfoot conditions e.g. slippery, uneven and rough surfaces
- unrestricted people access
- work in isolated and remote environments.

OHS may include:

- Australian standards
- development of site safety plan
- identification of potential hazards
- inspection of work sites
- training staff in OHS requirements
- use of personal protective clothing
- use of safety equipment and signage.

Legislative requirements
may include:

- Australian standards
- award and enterprise agreements

- certification requirements
- codes of practice
- quality assurance requirements.
- Legal and statutory standards*** may include:
 - local government requirements
 - national standards
 - state statutes and regulations.
- Contingencies*** may include:
 - equipment failure
 - injury to personnel
 - personnel turnover
 - observation errors
 - obstructions to design survey
 - weather.
- Measured and set out data*** may include:
 - computer-aided design (CAD) equipment
 - current meter
 - echo sounder
 - global navigation satellite system (GNSS)
 - level
 - photogrammetry
 - remote sensing
 - theodolite
 - tide gauge
 - total station.
- Specifications*** may include:
 - detailed technical descriptions of survey data and its requirements
 - preparation of cross-sections and plans with all information included.
- Clients*** may include:
 - external to organisation
 - customers with routine or special requests
 - internal to organisation
 - regular and new customers, including:
 - members of the public
 - business enterprises
 - government agencies
 - suppliers.
- Required documentation*** may include:
 - electronic or paper-based correspondence with client
 - field records
 - final report
 - organisational work activity sheets
 - records of conversation
 - survey plots.

Unit Sector(s)

Surveying and spatial information services

Custom Content Section

Not applicable.