



Australian Government

Department of Education, Employment and Workplace Relations

CPCCSV5007A Undertake site surveys and set-out procedures for building projects

Release: 1

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Modification History

Not Applicable

Unit Descriptor

Unit descriptor

This unit of competency specifies the outcomes required to undertake site surveys and set out procedures for civil and residential building projects.

It includes the use of basic measuring and levelling equipment, recording and interpretation of data, and evaluation of and compliance with relevant legislation.

Application of the Unit

Application of the unit

This unit of competency supports the attainment of the understanding and skills to undertake site surveys and set out procedures for building projects within the context of relevant legislation, the Building Code of Australia (BCA) and Australian standards.

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units

Nil

Employability Skills Information

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

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Measure linear distances on site using building and basic surveying equipment.	<p>1.1. Areas and volumes of regular shapes and figures are calculated.</p> <p>1.2. Distances are measured accurately, independent of site characteristics and measurement methods, using basic surveying equipment.</p> <p>1.3. Distances are measured on building sites within a tolerance of 1mm error in 4.0m (1:4000) or without error.</p> <p>1.4. Overall distances are calculated from field data without error.</p> <p>1.5. Slope corrections are recorded accurately.</p>
2. Carry out a closed level transverse procedure using the rise and fall recording method.	<p>2.1. Levelling equipment is inspected for damage, wear and serviceability.</p> <p>2.2. Set-up steps are performed and instruments made ready for use without error.</p> <p>2.3. Instruments are checked for accuracy and adjusted (where possible) within 3mm over 60 metres using the two peg test.</p> <p>2.4. Closed level traverse procedure is completed with a minimum of 15 points, including an inverted reading, with a minimum of 5 change points all within a closing tolerance of 10mm.</p> <p>2.5. Data of traverse is correctly recorded and extended including mathematical column checks by use of the rise and fall method.</p>
3. Perform grid surveys for contour purposes.	<p>3.1. Site identification for site surveying and setting out procedures is established and all survey pegs are located without error.</p> <p>3.2. Grid distances are determined and grid is pegged correctly.</p> <p>3.3. Site detail that may effect building operation is recorded without error.</p> <p>3.4. Reduced levels of all grid points are determined from a close performed onto the bench mark to within 10mm, without error.</p> <p>3.5. Contour lines are plotted on the site plan at intervals appropriate to the site with longitudinal and cross sections pegged and measured as nominated within 100mm. Sections are plotted to scale without error.</p> <p>3.6. Grades of line are determined within a 0.5% tolerance and expressed as percentage, rise to run ratio, or degrees.</p> <p>3.7. Cut and fill volumes of soil are calculated from site plan using contour lines for determining reduced</p>

ELEMENT**PERFORMANCE CRITERIA**

levels (RLs) within 5% tolerance.

ELEMENT	PERFORMANCE CRITERIA
4. Set out T-shaped or L-shaped buildings on a selected site with minimal profiles.	4.1. Site information is identified from site plan and dimensions are checked on plan drawings without error. 4.2. Site is identified and survey pegs are measured to ensure correct identification occurs before pilot pegs are positioned within 50mm of true location of the squared building dimensions. 4.3. Profile pegs are set up on site at a working distance from pilot pegs and parallel to pilot line. 4.4. Profile boards are fixed to pegs and level within 5mm and 15mm of each other. 4.5. Profiles are set out on steep slopes accurately.
5. Set up and use levelling devices to determine horizontal and vertical angles.	5.1. Basic tests on levelling devices' accuracy/adjustment are performed to manufacturer specifications. 5.2. Temporary adjustments to set up levelling devices are carried out to standard operating procedures. 5.3. Levelling devices are used to determine (read) both horizontal and vertical angles to an accuracy of 20 seconds. 5.4. Levelling devices are used to set out horizontal angles to an accuracy of 20 seconds. 5.5. Site is set out to specifications using a typical levelling device and tape.
6. Identify suitability of levelling and surveying equipment for large building projects.	6.1. Differences between various types of specialised surveying equipment are researched and recorded. 6.2. Equipment is used to control set out and vertical is identified. 6.3. Basic differences in survey control and set out between frame and concrete multi-storey buildings is outlined. 6.4. Survey of each level for vertical accuracy of 10mm is carried out using two levelling devices.
7. Compute coordinates, bearings and distances related to grids and general set out work on large building sites.	7.1. Angular relationship between different bearings (whole circle) is demonstrated and bearings from angles and fixed lines are determined. 7.2. Bearing and distance between two sets of coordinates (north and east) are calculated. 7.3. Coordinates of a point, given the bearing and distance from a point with known coordinates, are calculated. 7.4. Offsets from a coordinated point, given the bearing and distance from a point with known coordinates, are determined. 7.5. Information necessary to set out a structure, or part thereof, using a site plan with positions fixed by a

ELEMENT**PERFORMANCE CRITERIA**

mixture of bearings and distances, offsets and coordinates is calculated.

ELEMENT	PERFORMANCE CRITERIA
Evaluate documents and plans incorporated in land titles.	<p>7.6. Documents that make up a land title are listed and their relationship to each other outlined according to relevant government legislation.</p> <p>7.7. Different restrictions on the use of land title and restricted development are illustrated.</p> <p>7.8. Building covenants and statutory bodies responsible are identified.</p> <p>7.9. Restrictions stated in legislation that regulate setbacks for residential buildings are identified and differentiated.</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills for this unit are:

- ability to respond to change and contribute to workplace responsibilities, such as current work site environmental and sustainability frameworks or management systems
- communication skills to:
 - communicate construction problems to appropriate personnel
 - enable clear and direct communication, using questioning to identify and confirm requirements, share information, listen and understand
 - read and interpret:
 - field data
 - reports
 - site plan
 - specifications
 - working drawings
 - use and interpret non-verbal communication
 - use language and concepts appropriate to cultural differences
 - written skills to:
 - document suitability of surveying equipment
 - record mathematical information
- numeracy skills to apply measurements and calculations
- planning and organisational skills to collect, organise and analyse information

REQUIRED SKILLS AND KNOWLEDGE

- problem solving skills to identify faults and problems in, and accuracy of, equipment and take appropriate remedial action
- technological skills to:
 - complete documentation and calculations
 - enable information gathering and analysis.

Required knowledge

Required knowledge for this unit is:

- level and grade checking to perform survey control to accuracy criteria
- processes for the administration and preparation of documentation
- processes for the interpretation of reports, working drawings and specifications
- relevant federal, state or territory legislation and local government policy and procedures
- research methods
- specifications and capabilities of surveying and levelling equipment and their componentry
- structural, design and construction principles of buildings.

Evidence Guide

EVIDENCE GUIDE

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

Overview of assessment

This unit of competency could be assessed in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques fully replicate construction workplace conditions, materials, activities, responsibilities and procedures.

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 the ability to:

- comply with OHS regulations applicable to workplace operations
- apply organisational management policies and procedures, including quality assurance requirements where applicable.
- apply surveys and set out procedures to building projects and the associated reporting of data, findings, recommendations and strategies for at least one civil or residential building project or equivalent in compliance with relevant legislation
- provide reports to appropriate body/individual as determined by the project brief.

Context of and specific resources for assessment

This competency is to be assessed using standard and authorised work practices, safety requirements and environmental constraints.

Assessment of essential underpinning knowledge will usually be conducted in an off-site context.

Assessment is to comply with relevant regulatory or Australian standards' requirements.

Resource implications for assessment include:

- an induction procedure and requirement
- realistic tasks or simulated tasks covering the mandatory task requirements
- relevant specifications and work instructions
- tools and equipment appropriate to applying safe work practices
- support materials appropriate to activity

EVIDENCE GUIDE

- workplace instructions relating to safe work practices and addressing hazards and emergencies
- material safety data sheets
- research resources, including industry related systems information.

Reasonable adjustments for people with disabilities must be made to assessment processes where required. This could include access to modified equipment and other physical resources, and the provision of appropriate assessment support.

Method of assessment

Assessment methods must:

- satisfy the endorsed Assessment Guidelines of the Construction, Plumbing and Services Training Package
- include direct observation of tasks in real or simulated work conditions, with questioning to confirm the ability to consistently identify and correctly interpret the essential underpinning knowledge required for practical application
- reinforce the integration of employability skills with workplace tasks and job roles
- confirm that competency is verified and able to be transferred to other circumstances and environments.

Validity and sufficiency of evidence requires that:

- competency will need to be demonstrated over a period of time reflecting the scope of the role and the practical requirements of the workplace
- where the assessment is part of a structured learning experience the evidence collected must relate to a number of performances assessed at different points in time and separated by further learning and practice, with a decision on competency only taken at the point when the assessor has complete confidence in the person's demonstrated ability and applied knowledge
- all assessment that is part of a structured learning experience must include a combination of direct, indirect and

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supplementary evidence.

Assessment processes and techniques should as far as is practical take into account the language, literacy and numeracy capacity of the candidate in relation to the competency being assessed.

Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.

Range Statement

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, if used in the performance criteria, is detailed below. 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) may also be included.

Basic surveying equipment
includes:

- electronic distance measuring (EDM)
- laser instruments
- optical plummets
- pegs
- theodolites.

Site surveying and setting out procedures:

- include civil and residential building development projects
- may include commercial and industrial projects.

Unit Sector(s)

Unit sector

Construction

Co-requisite units

Co-requisite units Nil

Functional area

Functional area