



Australian Government

Department of Education, Employment and Workplace Relations

CPCBC4018A Apply site surveys and set-out procedures to building and construction projects

Release: 1

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Modification History

Not Applicable

Unit Descriptor

Unit descriptor

This unit of competency specifies the outcomes required to conduct basic measuring and levelling techniques as part of the set-out procedures performed on building projects. It includes the use of technical instruments, application of standard procedures and performance of calculations necessary in the set-out of construction projects.

Application of the Unit

Application of the unit

This unit of competency supports builders, site supervisors and related construction industry professionals responsible for ensuring accurate application of site surveys and set-out procedures prior to residential and commercial construction.

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. Perform setting out, measuring techniques and associated calculations.	<ul style="list-style-type: none">1.1. Trigonometric and geometric calculations commonly used with grid lines, off sets and right angle triangles are calculated and recorded without error.1.2. Site set-out procedures are carried out according to standard work methods on <i>sites</i>.1.3. Errors in measured distances due to site characteristics and measurement methods are identified and explained.1.4. <i>Cut and fill calculations</i> are conducted without error.
2. Set up and use levelling devices.	<ul style="list-style-type: none">2.1. Use of <i>levelling device</i> is demonstrated in accordance with standard operating procedures.2.2. Error present in a level by the 'two peg test' device is demonstrated in accordance with standard operating procedures.2.3. Reduction in a closed level run by rise and fall method and by height of plane of collimation (HPC) method is carried out in accordance with standard practices.2.4. Calculation of staff readings to enable a specific reduced level (RL) set-out to be determined is calculated without error.
3. Mark out and determine levels on a grid for contouring and volume calculations.	<ul style="list-style-type: none">3.1. Set out grid and levels are determined.3.2. Contour plans are prepared from grid levels to specified tolerances and stated contour intervals.3.3. Volume of solids and the surface being levelled and contoured are determined to specified tolerances.
4. Construct longitudinal sections and determine associated grades and levels in typical drainage and pipeline situations.	<ul style="list-style-type: none">4.1. Longitudinal sections are drawn from reduced levels and running chainages.4.2. Levels and clearances from given grades and distances are determined to specified tolerances.4.3. Calculations and expressions of grades in <i>three forms</i> are determined to specified tolerances.4.4. Calculations for batter levels from grades and distances are determined without error.

Required Skills and Knowledge

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:

- application of design concepts and principles relating to structural systems
- application of measurements and calculations
- attention to detail when transferring levels
- communication skills to:
 - enable clear and direct communication, using questioning to identify and confirm requirements, share information, listen and understand
 - read and interpret plans
 - use and interpret non-verbal communication
 - use language and concepts appropriate to cultural differences
- numeracy skills to apply measurements and calculations
- use of levelling devices for survey and site set outs.

Required knowledge

Required knowledge for this unit is:

- applications of structure in building systems and application to survey and site set-out
- BCA and Australian standards
- design principles
- level and grade checking used to perform survey control to accuracy criteria
- nature of survey and levelling devices and effect of performance on site
- work drawings and specifications.

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 by the application of survey and site set-out procedures and principles of selection and use of two levelling devices to survey and set out building projects. This unit of competency can be assessed in the

EVIDENCE GUIDE

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.

EVIDENCE GUIDE

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 and organisational quality procedures and process within the context of this unit of competency
- apply and interpret relevant documentation and codes
- accurately apply survey and levelling principles relating to performance of site set-out, including contouring, volume and grade calculations
- identify typical faults and problems and necessary action taken to rectify such faults.

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:

- documentation, including design brief drawings, specifications, codes, design concepts, construction schedules and other necessary supporting documents
- research resources, including levelling device information and data
- access to relevant legislation, regulations and codes of practice
- relevant computer software package and suitable hardware where applicable to survey and set-out practices.

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

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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 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.

Sites include:

- low rise commercial construction
- residential developments.

Cut and fill calculations include:

- area and volume of land to be levelled
- area of land to be filled
- use of appropriate software
- volume of fill required.

Levelling devices include:

- electronic distance measuring (EDM) equipment
- laser
- optical plummets
- theodolite.

Three forms relate to:

- angles
- percentages
- run ratios.

Unit Sector(s)

Unit sector Construction

Co-requisite units

Co-requisite units Nil

Functional area

Functional area

