



Australian Government

Department of Education, Employment and Workplace Relations

CPCCCA3023A Carry out levelling operations

Release: 1

CPCCCA3023A Carry out levelling operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor This unit of competency specifies the outcomes required to conduct levelling procedures using the rise and fall method and the height of instrument method for the purpose of establishing correct and accurate set out of buildings, their components and preparation. It includes the set up, testing and use of levelling devices and undertaking closed traverses using a range of levelling equipment.

Application of the Unit

Application of the unit This unit of competency supports achievement of skills to accurately use a variety of levelling devices commonly used in the construction industry to establish accurate set out data for a range of construction projects, which includes working with others and as a member of a team.

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units CPCCOHS2001A Apply OHS requirements, policies and procedures in the construction industry

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. Plan and prepare.	1.1. Work instructions, including plans, specifications, quality requirements and operational details, are obtained, confirmed and applied from relevant information. 1.2. Safety (OHS) requirements are followed in accordance with safety plans and policies. 1.3. Signage and barricade requirements are identified and implemented. 1.4. Tools and equipment selected to carry out tasks are consistent with job requirements, checked for serviceability, and any faults are rectified or reported prior to commencement. 1.5. Material quantity requirements are calculated in accordance with plans, specifications and quality requirements. 1.6. Materials appropriate to the work application are identified, obtained, prepared, safely handled and located ready for use. 1.7. Environmental requirements are identified for the project in accordance with environmental plans and statutory and regulatory authority obligations, and are applied.
2. Conduct levelling procedures using rise and fall method.	2.1. Instrument is accurately set up and tested for operation before commencing levelling activities. 2.2. Datum point is set up or located. 2.3. Readings are taken to datum and at nominated or selected stations, to project specifications. 2.4. Backsights, intermediate sights and foresights are identified and levels are booked. 2.5. Instrument is transferred to another location and the process is repeated to project specifications. 2.6. Accuracy of readings is established using rise and fall method of calculation. 2.7. Reduced levels for all stations are identified from the level book calculations.
3. Conduct levelling procedures using height of instrument method.	3.1. Instrument is accurately set up and tested for operation before levelling, including levelling equipment/device tolerance checks. 3.2. Datum point is set up or located. 3.3. Level readings are taken to datum and the interim

ELEMENT	PERFORMANCE CRITERIA
	reduced level is established.
	3.4. Readings are taken at nominated or selected stations to project specifications.
	3.5. Instrument is transferred to another location and the process is repeated to project specifications.
	3.6. Reduced levels are calculated using height of instrument method.
	3.7. Reduced levels for all stations are identified from the calculations and heights and levels recorded .
4. Calculate distances using stadia lines.	4.1. Cross hair readings are checked for accuracy using stadia lines.
	4.2. Distances are calculated from instrument to stations using staff, stadia lines and identified factor of the levelling instrument.
5. Clean up.	5.1. Work area is cleared and materials disposed of, reused or recycled in accordance with legislation, regulations, codes of practice and job specification.
	5.2. Tools and equipment are cleaned, checked, levelling devices maintained and stored in accordance with manufacturer recommendations and standard work practices.

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:

- basic levelling
- communication skills to:
 - determine requirements
 - enable clear and direct communication, using questioning to identify and confirm requirements, share information, listen and understand
 - follow instructions
 - read and interpret:
 - documentation from a variety of sources

REQUIRED SKILLS AND KNOWLEDGE

- plans, specifications and drawings
- report faults
- use language and concepts appropriate to cultural differences
- use and interpret non-verbal communication, such as hand signals
- numeracy skills to apply measurements and make calculations
- organisational skills, including the ability to plan and set out work
- teamwork skills to work with others to action tasks and relate to people from a range of cultural and ethnic backgrounds and with varying physical and mental abilities
- technological skills to:
 - use a range of mobile technology, such as two-way radio and mobile phones
 - voice and hand signals to access and understand site-specific instructions.

Required knowledge

Required knowledge for this unit is:

- application and requirements for line, level and plumb in construction projects
- basic construction and levelling processes
- construction plan, symbols and construction terminology
- construction terminology
- job safety analysis (JSA) and safe work method statements
- levelling device types, characteristics, technical capabilities and limitations
- levelling techniques commonly used in construction work
- processes for interpreting engineering drawings and sketches
- processes for setting out
- project quality requirements
- site and equipment safety (OHS) requirements
- site isolation and traffic control responsibilities and authorities.

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:

- locate, interpret and apply relevant information, standards and specifications
- comply with site safety plan, OHS regulations and state and territory legislation applicable to workplace operations
- comply with organisational policies and procedures, including quality requirements
- safely and effectively use tools and equipment
- communicate and work effectively and safely with others
- set up and test levelling equipment
- transfer levels and record differences in height undertaking a closed traverse using both the rise and fall method and the height of instrument method on a minimum of three projects
- confirm accuracy of the readings taken, including set up and movement of device in two locations
- accurately record the results of each levelling procedure to organisational requirements
- calculate distances using an optical levelling instrument and levelling staff.

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

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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
- 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

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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.

Information includes:

- diagrams or sketches
- instructions issued by authorised organisational or external personnel
- manufacturer specifications and instructions where specified
- memos
- MSDS

RANGE STATEMENT

Safety (OHS) is to be in accordance with state or territory legislation, regulations, codes of practice, organisational safety policies and procedures, and project safety plan and may include:

- organisation work specifications and requirements
- plans and specifications
- regulatory and legislative requirements pertaining to the conduct of basic demolition processes
- relevant Australian standards
- safe work procedures related to the conduct of basic demolition processes
- signage
- verbal or written and graphical instructions
- work bulletins
- work schedules.
- emergency procedures, including extinguishing fires, organisational first aid requirements and evacuation
- handling of materials
- hazard control
- hazardous materials and substances
- safe operating procedures, including the conduct of operational risk assessment and treatments associated with:
 - earth leakage boxes
 - lighting
 - personnel
 - power cables, including overhead service trays, cables and conduits
 - restricted access barriers
 - surrounding structures
 - traffic control
 - trip hazards
 - work site visitors and the public
 - working at heights
 - working in confined spaces
 - working with dangerous materials
- organisational first aid
- personal protective clothing and equipment prescribed under legislation, regulations and workplace policies and practices
- use of firefighting equipment
- use of tools and equipment

RANGE STATEMENT

<i>Tools and equipment</i> include:	• workplace environment and safety. • automatic level and levelling staff • bolt cutters • chalk lines • hammers • laser levels • laser targets • marking equipment • measuring tapes and rules • plumb bobs • saw stools • saws • signage for laser levelling • spirit levels and straight edges • string lines • water levels • wooden and steel pegs.
<i>Quality requirements</i> include relevant regulations, including:	• Australian standards • internal company quality policy and standards • manufacturer specifications, where specified • workplace operations and procedures.
<i>Environmental requirements</i> include:	• clean-up management • waste management.
<i>Statutory and regulatory authorities</i> include:	• federal, state and local authorities administering applicable Acts, regulations and codes of practice.
<i>Levelling activities</i> include:	• approximate distances and the transfer of the data points • location of services • positioning offsets and recovery pegs for construction projects or for use in determining quantity from calculations. • recording ground levels at respective critical set out points • recording heights or levels • recording slab or pad levels for placement of steel columns or masonry piers • recording or checking levels in drainage • setting up devices • shooting levels for concrete slabs

RANGE STATEMENT

	• shooting levels for excavation/footings • sloping blocks • transferring levels/heights for formwork • those undertaken in a team arrangement. • closed traverse.
Levelling procedures include:	
Levelling equipment/device tolerance checks include:	• a two peg test for automatic level • reverse readings for spirit level.
Level readings include:	• datum backsight, foresight and intermediate sight from stations with known or unknown reduced levels, using height of instrument and rise and fall calculations.
Heights and levels recorded may be by:	• chalk or nail mark • datum/survey peg • drawing or sketch • marks on vertical surface • verbal or written instructions.
Levelling devices maintained:	• include: • authorised servicing • cleaning • monitoring, recording and reporting faults • may include the conduct of authorised minor replacements.

Unit Sector(s)

Unit sector Construction

Co-requisite units

Co-requisite units Nil

Functional area

Functional area