Australian Government

Department of Education, Employment and Workplace Relations

CPCCJS3011A Design and set out stairs

Release: 1

CPCCJS3011A Design and set out stairs

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit specifies the outcomes required to design and set out dressed material to prepare for manufacturing processes in preparation for the assembly of components to construct a stair.

Application of the Unit

Application of the unit	This unit of competency supports the achievement of skills and knowledge to design and set out stairs, which may include 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 for work.	1.1. ***Quality assurance requirements*** with company's stair-building operations are recognised and adhered to.
	1.2. ***Safety*** (***OHS***) requirements in accordance with setting out of stairs and workshop operations are recognised and adhered to.
	1.3. ***Design of stair*** is identified from job drawings and specifications for types of stair construction and stair components to be set out.
	1.4. Doorways and head height clearance are measured and dimensions governing stair pitch and ***factors of design*** are obtained directly from constructed building or drawing details.
	1.5. ***Rise and going for steps*** are determined and lengths of strings calculated appropriate for the stair use and structural design, including landings if specified.
	1.6. Use and structural design for ***winders*** are identified and considered for inclusion in stair set-out if required.
	1.7. Methods of joining stair ***components*** and balustrade members are identified for ***manufacturing processes*** and preparation of components for joining.
	1.8. Storey rod and full size set-out are prepared where applicable.
2. Prepare stair material for setting out.	2.1. ***Materials*** are selected and dressed in accordance with stair requirements and specifications.
	2.2. Laminated sections are formed and joined to designed curve and pitch to specifications.
3. Set out strings for a stair.	3.1. ***Tools and equipment*** are selected to carry out processes consistent with job requirements.
	3.2. Steel square or pitch board is prepared to stair pitch set-out.
	3.3. Strings are set out in temporary erected positions to show locations of treads and risers, with allowances for nosing and wedges on closed strings and to show lengths for junctions with newels and landings
4. Set out newels.	4.1. Floor/landing height relationships with allowances for floor discrepancies are accurately marked on newels.
	4.2. Newels are set out to show positions of strings, treads, flooring, joists, bearers and handrails.

ELEMENT	PERFORMANCE CRITERIA
	4.3. Locations for housings are accurately marked on newels.
5. Set out component parts.	5.1. Lengths and bevels, where applicable, are determined from string and newel set-outs. 5.2. Component parts are set out to respective lengths and bevels where applicable.

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 recognise procedures, respond to change and contribute to workplace responsibilities, such as current work site environmental or sustainability frameworks or management systems
- communication skills to:
  - enable clear and direct communication, using questioning to identify and confirm requirements, share information, listen and understand
  - follow instructions
  - read and interpret drawings and specifications
  - use and interpret non-verbal communication
  - use language and concepts appropriate to cultural differences
- innovation skills to select appropriate tools and equipment, respond to workplace challenges and put ideas into action
- numeracy skills to apply measurements and calculations
- planning and organisational skills to identify requirements, apply relevant resources and sequence tasks
- problem solving skills to recognise and take action to rectify minor faults and problems
- teamwork skills to be able to work with others to action tasks and relate to people from a range of cultural, social, ethnic backgrounds and with varying physical and mental abilities.

Required knowledge

Required knowledge for this unit is:

- Building Code of Australia (BCA)

REQUIRED SKILLS AND KNOWLEDGE

- calculations related to lineal measurements in stair design
- component parts of balustrades, landings and stairs
- drawings and specifications
- handling of materials relevant to stair construction
- job safety analysis (JSA) and safe work method statements
- materials relevant to stair construction
- measuring and setting out related to stair construction
- organisation's quality assurance requirements
- stair construction and joining methods
- terminology of components and dimensional relationships
- tools and equipment related to stair setting out
- types of stairs
- workplace and equipment safety requirements.

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 set out at least two types of stair designs listed in the range statement, providing evidence of the ability to:

- comply with OHS regulations applicable to workplace operations
- apply organisational quality procedures and processes within context of preparation of material and setting out for timber stairs
- identify details and specifications of nominated stair to be set out
- identify limitations on design in accordance with BCA
- demonstrate appropriate calculations to accurately determine number of rises, actual rise, run and going
- identify materials required and prepare accurate cutting list
- select materials and safely and effectively operate machines to dress material to specified sizes
- select and use appropriate processes, tools and equipment for setting out material
- display accurate application and clear marking in setting out materials for stair components
- demonstrate safe and effective handling procedures for movement and placement of material and components
- identify typical faults and problems that occur and action required to rectify them

EVIDENCE GUIDE

	• communicate with others to ensure safe and effective workplace operations.
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: • workplace operation, tools and equipment appropriate to activity • static machines appropriate to material preparation for setting out • material relevant to proposed activity • drawings, set-out, specifications and documentation relevant to activities. 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 a reasonable inference that competency is not only verified under the particular assessment circumstance, but is able to be transferred to other circumstances and environments. Validity and sufficiency of evidence requires that:

EVIDENCE GUIDE

- competency will need to be demonstrated over a period of time reflecting the scope of the role and 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.

Quality assurance requirements include:

- control of handling procedures
- procedures for setting out
- quality of materials
- use and maintenance of equipment
- workplace operations and procedures.

RANGE STATEMENT

Safety (***OHS***) is to be in accordance with state and territory legislation and regulations and project safety plan and may include:	• emergency procedures, including extinguishing fires, organisational first aid requirements and evacuation
	• hazard control
	• hazardous materials and substances
	• organisational first aid
	• PPE prescribed under legislation, regulations and workplace policies and practices
	• safe operating procedures, including the conduct of operational risk assessment and treatments associated with:
	  • concealed services (water, power and gas)
	  • lighting
	  • restricted access barriers
	  • traffic control
	  • work site visitors and the public
	  • working at heights
	  • working in confined spaces
	  • working in proximity to others
	• use of firefighting equipment
	• use of tools and equipment
	• workplace environmental requirements and safety.

Design of stair includes:	• open or closed string
	• curved flight
	• dog legged
	• geometric stairs
	• quarter spaced landings
	• spiral stairs
	• straight flights
	• ¼ winder stairs that include:
	  • a landing
	  • cut and closed strings.

Factors of design include:	• area available for stair and rise of stair • doorways and head height clearance • structural limitations in accordance with BCA.
Rise and going for steps are determined by:	• going for step design in accordance with minimum going according to classification of building • maximum allowable rise for each step

RANGE STATEMENT

	• total rise of the stair.
Winders are:	• designed with dimensions for winder treads in accordance with BCA • identified and included for use in lieu of landings.
Components include:	• balusters • handrails • landing bearers • landing joists • multiple railing • newels • risers • strings • treads.
Manufacturing processes include:	• docking to lengths • grooving • housing • mortising • rebating • trenching.
Materials include:	• medium density fibreboard (MDF) • plastics • plywood • steel • timber.
Tools and equipment include:	• bevels • marking gauge • measuring tapes and rules • squares • steel squares.

Unit Sector(s)

Unit sector Construction

Co-requisite units

Co-requisite units Nil

Functional area

Functional area