



Australian Government

Department of Education, Employment and Workplace Relations

FPICOT4202B Design timber structures

Release: 1

FPICOT4202B Design timber structures

Modification History

Not Applicable

Unit Descriptor

Unit descriptor

This unit specifies the outcomes required to interpret plans, select options and detail designs of timber structures. It also requires the provision of support and explanation of designs

General workplace legislative and regulatory requirements apply to this unit; however there are no specific licensing or certification requirements at the time of publication

This unit replaces FPICOT4202A Design timber structures

Application of the Unit

Application of the unit

The unit involves designing timber structures in a timber and wood products production setting

The skills and knowledge required for competent workplace performance are to be used within the scope of the person's job and authority

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Not Applicable

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. Interpret plans and loading conditions	<p>1.1. Applicable <i>Occupational Health and Safety</i> (OHS), environmental, <i>legislative</i> and <i>organisational requirements</i> relevant to designing timber structures are identified and followed</p> <p>1.2. <i>Drawings</i> and documentation are obtained and interpreted and <i>work requirements</i> are identified and complied with</p> <p>1.3. Plans are reviewed and interpreted and <i>loading information</i> is specified</p> <p>1.4. Drawing views and notes are interpreted and other design requirements and restrictions are specified</p> <p>1.5. Additional information and data is obtained from <i>appropriate personnel</i> and <i>other sources</i></p> <p>1.6. Functional and pictorial image of <i>structure</i> is created based on specified design requirements and constraints</p> <p>1.7. <i>Communication</i> with others is established and maintained in line with OHS and organisational requirements</p>
2. Develop and select truss and/or frame and/or floor layout options	<p>2.1. Fixed design details are transferred to truss and/or frame and/or floor layout drawings</p> <p>2.2. Engineered or pre-assembled trusses and/or frames and/or floors are nominated in line with budgetary constraints</p> <p>2.3. Component sizes and spacing details are defined in the design structure in line with <i>industry standards</i></p> <p>2.4. <i>Layouts</i> and spacing of individual structural members are progressively selected to meet design requirements</p> <p>2.5. Component sizes are fixed to clarify and firm design options</p>
3. Detail truss and/or frame and/or floor design	<p>3.1. Physical dimensions for components are calculated, scaled or extracted from tables of <i>applicable codes</i></p> <p>3.2. Effective lengths and spans for individual components are interpreted from layout, and cross-sections are selected in line with applicable</p>

ELEMENT	PERFORMANCE CRITERIA
	codes
	3.3. Selected <i>material options</i> are checked for suitability, availability, cost effectiveness and are consistently used throughout the design
	3.4. Component placement and spacing are detailed to site and customer standards
	3.5. Design specifications are provided for engineered or pre-assembled trusses and/or frames and/or floors in line with manufacturer's recommendations
	3.6. Production information, dimensions and notes are presented in <i>detail</i> , clearly and accurately within drawing views
	3.7. Design records and documentation are completed and maintained in line with workplace procedures
4. Provide design and production advice	4.1. Questions regarding designs and design decisions are answered and <i>explained</i> in a clear and concise manner
	4.2. Effective communication techniques are used to assist and develop production personnel
	4.3. Alternative materials and sizes for components are provided within the scope of the design and work requirements

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- Technical skills sufficient to safely detail and design timber structures which meet required standards and budgetary constraints and to produce design drawings suitable for use on construction sites
- Communication skills and interpersonal techniques sufficient to interact appropriately with colleagues and others in the workplace
- Literacy skills sufficient to accurately complete, record and maintain information
- Numeracy skills sufficient to select appropriate mathematical processes to calculate design dimensions and measure lengths and spans
- Problem solving skills sufficient to identify problems and demonstrate appropriate

REQUIRED SKILLS AND KNOWLEDGE

response procedures

Required knowledge

- Applicable Commonwealth, State or Territory legislation, regulations, standards, codes of practice and established safe practices relevant to the full range of processes for designing timber structures
- Organisational and site standards, requirements, policies and procedures
- Environmental protection requirements, including the safe disposal of waste material
- Quantitative relationship between component loads, supports and gains, and species, type, dimensions and grade
- Common industry terminology for all component types and timber cuts, all structure types and construction methods
- Industry standard cross-section sizes and profiles, length and spacing dimensions
- Established communication channels and protocols
- Problem identification and resolution strategies and common fault finding techniques
- Types of tools and equipment relevant to designing timber structures and procedures for their use, operation and maintenance
- Appropriate mathematical procedures for estimating and measuring, including calculating time to complete tasks
- Procedures for recording and reporting workplace information

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

A person who demonstrates competency in this unit must be able to provide evidence that they can accurately interpret plans to develop and design timber structures in line with industry and organisational requirements

Critical aspects for assessment and evidence required to demonstrate competency in this unit

The evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements of this unit and include demonstration of:

- following applicable Commonwealth, State or Territory legislative and regulatory requirements and codes of practice relevant to designing timber structures
- following organisational policies and procedures relevant to designing timber structures
- communication techniques and safe work practices in the work area
- interpreting drawings and loading conditions
- interpreting and applying technical information and conveying information in written, sketch and oral form
- applying mathematical procedures such as estimation and measurement
- developing and selecting truss and/or frame and/or floor layout options and detailing framing design
- providing design and production advice
- Competency is to be assessed in the workplace or realistically simulated workplace
- Assessment is to occur under standard and authorised work practices, safety requirements and environmental constraints
- Assessment of required knowledge, other than confirmatory questions, will usually be conducted in an off-site context
- Assessment is to comply with relevant regulatory or Australian Standards requirements
- The following resources should be made available:
 - workplace location or simulated workplace

Context of and specific resources for assessment

EVIDENCE GUIDE

Method of assessment

- materials and equipment relevant to undertaking work applicable to this unit
- specifications and work instructions
- Assessment must satisfy the endorsed Assessment Guidelines of the FPI11 Training Package
- Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of required knowledge
- Assessment must be by direct observation of tasks, with questioning on required knowledge and it must also reinforce the integration of employability skills
- Assessment methods must confirm the ability to access and correctly interpret and apply the required knowledge
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances
- Assessment may be in conjunction with assessment of other units of competency
- The assessment environment should not disadvantage the candidate
- Assessment practices should take into account any relevant language or cultural issues related to Aboriginality, gender or language backgrounds other than English
- Where the participant has a disability, reasonable adjustment may be applied during assessment
- Language and literacy demands of the assessment task should not be higher than those of the work role

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. **Italicised** wording, if used in the performance criteria, is detailed below. Essential operating

RANGE STATEMENT

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.

- OHS requirements:** are to be in line with applicable Commonwealth, State or Territory legislation and regulations, and organisational safety policies and procedures, and may include:
- personal protective equipment and clothing
 - safety equipment
 - first aid equipment
 - fire fighting equipment
 - hazard and risk control
 - fatigue management
 - elimination of hazardous materials and substances
 - manual handling including shifting, lifting and carrying
 - lifts and cranes, scaffolding, building codes and regulations
- Legislative requirements:** are to be in line with applicable Commonwealth, State or Territory legislation, regulations, certification requirements and codes of practice and may include:
- award and enterprise agreements
 - industrial relations
 - Australian Standards
 - confidentiality and privacy
 - OHS
 - the environment
 - equal opportunity
 - anti-discrimination
 - relevant industry codes of practice
 - duty of care
- Organisational requirements** may include:
- legal
 - organisational and site guidelines
 - policies and procedures relating to own role and responsibility
 - quality assurance
 - procedural manuals
 - quality and continuous improvement processes

RANGE STATEMENT

- and standards
 - OHS, emergency and evacuation procedures
 - ethical standards
 - recording and reporting requirements
 - equipment use and maintenance and storage requirements
 - environmental management requirements (waste disposal, recycling and re-use guidelines)
- Drawings** may be:
- direct to paper
 - using computer software
- Work requirements** may include:
- loading requirements
 - applicable codes
 - common industry practices
 - specific customer preferences
 - transport regulations
 - fabricating limitations
- Loading information** may include:
- details defining mass loads and externally applied loads (wind, surrounding structures, common/special building usage)
 - dimensions defining geometry and loading of individual structural members
- Appropriate personnel** may include:
- supervisors
 - clients
 - colleagues
 - line management
 - software support engineers
- Other sources** may include:
- suppliers
 - manufacturers
 - architect
 - builder
 - local council
- Structures** may include:
- timber roofs
 - wall frames and floors of solid brick, brick veneer and timber frame domestic houses
 - free-standing or attached timber structures such as pergolas
- Communication** may include:
- verbal and non-verbal language
 - constructive feedback
 - active listening
 - questioning to clarify and confirm

RANGE STATEMENT

- understanding
 - use of positive, confident and cooperative language
 - use of language and concepts appropriate to individual social and cultural differences
 - control of tone of voice and body language
- Industry standards** may include:
- Australian standards
 - international standards
 - nail plate provider standards
- Layouts**
- are selected to meet space and construction/assembly constraints and the most economical timber sizes and quantities
- Applicable codes** may include:
- AS1684 and supplementary tables
 - CSIRO supplementary tables
 - those from regulatory bodies and associations
 - the Building Code of Australia
- Material options**
- are selected with regard to exposure and weathering and may include timber of available species and solid or laminated types
- Detail**
- is in line with industry requirements for placement, projection and dimensions
- Explanations** may be provided to:
- customers
 - builders
 - councils
 - certifying authorities

Unit Sector(s)

Not Applicable

Competency field

Competency field

Common Technical