



Australian Government

# **FWPTMM5209 Determine prefabricated timber building systems designs for compliance, manufacture and installation**

Release: 1

# FWPTMM5209 Determine prefabricated timber building systems designs for compliance, manufacture and installation

## Modification History

| Release   | Comments                                                                              |
|-----------|---------------------------------------------------------------------------------------|
| Release 1 | This version released with FWP Forest and Wood Products Training Package Version 4.0. |

## Application

This unit of competency describes the skills and knowledge required to determine design solutions for panelised and/or modular prefabricated timber building systems to meet structural and safety compliance, off-site manufacture and on-site installation. The main job functions are to facilitate collaborative design and achieve detailed and integrated design solutions for prefabricated timber building systems.

The unit applies to individuals who work as designers in a building design team. These include architects, design engineers, draftspersons, structural engineers, building services engineers, architectural technicians and timber systems designers from manufacturing plants. They demonstrate in-depth knowledge in a specific technical area and analyse, design and communicate solutions to sometimes complex problems.

In order to undertake this unit, individuals must have a relevant building design qualification or equivalent.

No occupational licensing, legislative or certification requirements apply to this unit at the time of publication.

## Pre-requisite Unit

Nil

## Unit Sector

Timber Manufactured Products

## Elements and Performance Criteria

| Elements                                         | Performance Criteria                                                                                   |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| <i>Elements describe the essential outcomes.</i> | <i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i> |

| Elements                                                                                   | Performance Criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Elements describe the essential outcomes.</i>                                           | <i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 1. Interact with supply chain stakeholders to design prefabricated timber building systems | <p>1.1 Communicate with the developer during the design process to ensure that prefabricated timber building system is fully fit for purpose and meets client functional requirements</p> <p>1.2 Use Building Information Modelling (BIM) system or similar and conduct further collaborative analysis with the fabricator, builder, component suppliers and regulators to achieve a design configuration that allows for lean processes during all stages of <b>timber building system life cycle</b>, meets regulations and does not complicate other design considerations</p> <p>1.3 Ensure that the design accounts for fabrication capabilities</p> <p>1.4 Implement a continuous improvement process during the design life of prefabricated timber building system to report, record and resolve issues</p>                                                                                                                                                                                                                                                                                                                                                                                      |
| 2. Determine design solutions and specifications for structural compliance                 | <p>2.1 Identify the National Construction Code (NCC) Performance Requirements for structural robustness, which the prefabricated timber building system and its components need to satisfy</p> <p>2.2 Discuss structural design actions with appropriate stakeholders to ensure that the prefabricated timber building system meets the minimum NCC structural requirements and performs without risks when used as intended through its design life</p> <p>2.3 Obtain experimental and observational data for the strength of materials, structural components, connections or assemblies to determine design values, and consult with appropriate engineers to indicate the actual robustness and reliability of the physical building system</p> <p>2.4 Contribute to the design verification for structural compliance and process documentation according to the NCC, standards and codes to facilitate design certification and approvals</p> <p>2.5 Determine durability requirements for the materials of prefabricated timber building system according to the nominated design life and planned maintenance, and ensure that they are specified in design documentation for prefabricators</p> |
| 3. Determine design solutions and specifications for safety compliance                     | <p>3.1 Determine early in the design process hazards to health and safety during all stages of prefabricated timber building system life cycle according to the workplace health and safety laws, regulations and the NCC</p> <p>3.2 Determine and apply health and safety design control measures according to standards, codes and technical guides to eliminate or</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Elements                                                                                     | Performance Criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Elements describe the essential outcomes.</i>                                             | <i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                                              | <p>minimise health and safety risks during all stages of prefabricated timber building system life cycle</p> <p>3.3 Verify design documentation and ensure that health and safety provisions are specified for all stages of prefabricated timber building system life cycle according to standards, codes and technical guides</p> <p>3.4 Verify design documentation and ensure that detailed maintenance provisions are specified for all components of the prefabricated timber building system being designed according to its intended functions</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 4. Determine design solutions and specifications for services                                | <p>4.1 Identify the NCC Performance Requirements for fire resistance and acoustic and thermal properties, which the prefabricated timber building system and its components need to satisfy</p> <p>4.2 Verify design documentation and ensure that intended materials, separations, insulations, fire warnings and fire-fighting management systems are specified for the required fire, acoustic, thermal and waterproofing performance according to standards, codes and technical guides</p> <p>4.3 Use design control actions to mitigate any possible effects of transportation, handling, on-site installation or maintenance on the integrity of intended connections, insulations or materials</p> <p>4.4 Determine early in the design phase where points of entry are required in the prefabricated timber building system, components and materials for services installation</p> <p>4.5 Verify design documentation and ensure that installation and connections provisions are specified for each service according to standards, codes and technical guides</p> <p>4.6 Ensure that all tolerances for the prefabricated timber building system and its components are specified in the design specifications according to standards to facilitate off-site manufacture and on-site installation</p> <p>4.7 Verify and ensure that approval and compliance certification for installation of services, partitions and floor elements are performed to the appropriate standards for thermal, acoustic and fire performance and according to local requirements before on-site installation</p> |
| 5. Determine design solutions and specifications for transportation and on-site installation | <p>5.1 Determine maximum dimensions and weight for the building system being designed to meet restrictions provided by vehicles, lifting plants, road configuration around the construction site and local regulations</p> <p>5.2 Ensure that lifting requirements are specified for all stages of the</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Elements                                         | Performance Criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Elements describe the essential outcomes.</i> | <i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                  | <p>prefabricated timber building system life cycle in the design documentation, and they are according to the NCC to facilitate and maintain prefabricated timber building system integrity and adequate performance</p> <p>5.3 Determine the effects of cargo restraints and exposure to acceleration forces on the strength (structural attributes) of prefabricated timber building system during transportation, and use design control actions to allow for the forces applied</p> <p>5.4 Verify the design and ensure that necessary restraint conditions during transport and residual risks to the prefabricated timber building systems resulting from transportation are specified</p> <p>5.5 Ensure that the sequence for the installation of prefabricated timber building systems and components is specified in design documentation</p> |

## Foundation Skills

*This section describes those language, literacy, numeracy and employment skills that are essential for performance in this unit of competency but are not explicit in the performance criteria.*

| Skill                      | Description                                                                                                                                                                                        |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Oral communication         | <ul style="list-style-type: none"> <li>Communicate information verbally about complex, detailed technical design information</li> </ul>                                                            |
| Numeracy                   | <ul style="list-style-type: none"> <li>Conduct complex structural design calculations</li> </ul>                                                                                                   |
| Navigate the world of work | <ul style="list-style-type: none"> <li>Monitor adherence to legal and industry standards and responsibilities</li> </ul>                                                                           |
| Interact with others       | <ul style="list-style-type: none"> <li>Identify the perspectives of others as part of work role</li> <li>Seek specialist input into problem-solving and decision-making</li> </ul>                 |
| Get the work done          | <ul style="list-style-type: none"> <li>Use three-dimensional models, BIM or computer-aided design tools to design, monitor design processes and access and organise complex design data</li> </ul> |

## Unit Mapping Information

| Code and title current version                                                                                     | Code and title previous version | Comments | Equivalence status |
|--------------------------------------------------------------------------------------------------------------------|---------------------------------|----------|--------------------|
| FWPTMM5209<br>Determine prefabricated timber building systems designs for compliance, manufacture and installation | Not applicable                  | New unit | No equivalent unit |

## Links

Companion Volumes, including Implementation Guides, are available at VETNet: - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=0d96fe23-5747-4c01-9d6f-3509ff8d3d47>