



Australian Government

Department of Education, Employment and Workplace Relations

CPCSFS5002A Research and interpret detailed fire systems design project requirements

Release: 1

CPCSFS5002A Research and interpret detailed fire systems design project requirements

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency specifies the outcomes required to obtain and process design drawings and documentation required for the preparation of detailed fire systems designs and make an initial assessment of the how fire systems are affected by other aspects of the project. The unit also covers researching detailed fire systems' compliance requirements and regulatory processes and negotiating solutions to conflicts arising between the design brief and compliance or installation requirements. Licensing, legislative, regulatory or certification requirements may apply to this unit and so the varying state or territory requirements should be confirmed with the relevant body.
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Application of the Unit

Application of the unit	This unit of competency supports the role of fire systems' designers who need to gather and process fire systems design project drawings and documentation and establish the detailed design and compliance requirements for fire systems. The role also involves assessing the impact of building construction and services installation on the detailed fire systems design and negotiating solutions to any conflicts arising. Fire systems designs are limited to those within the deemed-to-satisfy provisions of the Building Code of Australia or detailed fire systems designs for alternative solutions designed by fire engineers. This unit does not apply to fire systems for special hazard locations.
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Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units	Nil
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Employability Skills Information

Employability skills	This unit contains employability skills.
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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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Gather and interpret project initiation documentation.	1.1. Fire systems design briefs, plans and specifications are gathered and checked for currency and completeness. 1.2. The specific requirements of engineered or innovative solutions, designed and specified by fire engineers, are interpreted. 1.3. Relevant drawings, plans and schedules for the building project are requested, obtained and filed according to workplace and project procedures. 1.4. Impacts of building construction and the installation of other services on fire systems design are assessed to pre-empt possible issues.
2. Research the detailed requirements of relevant legislation and regulatory processes.	2.1. Legislation impacting on design compliance in different project locations is investigated and variations in requirements are interpreted and noted. 2.2. Regulatory requirements impacting on fire systems designs and project processes in different locations are investigated and specific requirements are interpreted and noted.
3. Research the detailed requirements of applicable codes and standards.	3.1. Applicable codes and standards are gathered and checked for currency. 3.2. Requirements relating to specific fire systems in different types of buildings and situations are researched and interpreted. 3.3. In situations where more than one code or standard is applicable, the most rigorous requirements are determined and applied.
4. Consult and negotiate to clarify and finalise project details.	4.1. The interpretation of the required fire systems design and intended layout and interconnection are confirmed with relevant personnel. 4.2. Consultation and negotiations are undertaken with relevant personnel to resolve conflicts between the design brief and regulatory or insurance requirements. 4.3. Consultation and negotiations are undertaken with relevant personnel to resolve conflicts between the design brief, the requirements of building construction, and the installation of the fire systems and other services. 4.4. Aesthetic requirements relating to the location of fire system components and installation methods are clarified and solutions negotiated.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- accurate measuring
- accurate naming and filing of drawings, including:
 - formal document control
 - formal amendments, including:
 - history
 - transmittal notices
- editing and creating drawings, including:
 - layout
 - section
 - detail
 - external references
 - freezing layers
- operating computer software packages and systems, including:
 - word processing
 - spreadsheet
 - email
 - internet
 - proprietary project management software
 - parametric modelling of services coordination using proprietary software, such as Navis-Works or MEP-REVIT
- numeracy skills for calculating dimensions
- language and literacy skills for:
 - listening to and communicating clearly with colleagues and contractors
 - participating in meetings, such as negotiations with fire engineering consultant, architect, builder or other service contractors
 - researching, accessing, reading, interpreting and applying current relevant legislation, codes and standards
 - letter writing, especially to formalise:
 - recognition of conflicts and errors on drawings supplied by other service contractors
 - agreements with other services, for example whichever service is fitted last must fit around existing services

REQUIRED SKILLS AND KNOWLEDGE

- updating knowledge of products, software systems and technology
- reading and interpreting drawings, plans and specifications, including:
 - architectural
 - structural
 - mechanical
 - hydraulic
 - electrical
- researching and evaluating competing technologies in new products and systems
- developing constructive and cooperative working relationships with project team members, workplace colleagues and clients
- negotiation and conflict management
- initiating and running meetings with lead contractor and other service contractors
- project management
- organising own work, including creating personal systems and checklists for planning, managing and checking work
- lateral thinking and problem solving
- maintaining concentration, focus and attention to detail for long periods

Required knowledge

- workplace design tools and processes
- level of accuracy required in detailed design drawings
- naming conventions for design drawings and drawing register
- fire science, including:
 - fire behaviour and dynamics
 - impact of fire on structures and materials
 - products of combustion
 - fire control strategies
 - fire retardants
 - fire detection technologies
 - fire suppression technologies
 - fire containment
- fire engineering principles, including:
 - engineered solutions
 - innovative fire systems
 - fire modelling
- parametric modelling software, such as Navis-Works or MEP-REVIT
- computer software functions and operation, including:
 - word processing

REQUIRED SKILLS AND KNOWLEDGE

- spreadsheet
- email
- internet
- proprietary project management software
- relevant current legislation, codes and standards, including:
 - building Acts
 - building regulations
 - infrastructure supply regulations
 - the Building Code of Australia
 - Australian standards for fire systems
 - international standards for fire systems
 - other fire system standards commonly required by building insurers
- regulatory requirements, systems and processes
- protection requirements for different buildings
- fire systems' technology and components, including:
 - water-based systems, including:
 - wet pipe sprinkler systems
 - deluge and drencher systems
 - dry pipe sprinkler systems
 - pre-action sprinkler systems
 - early suppression fast response (ESFR)
 - hydrants, hose reels and monitors
 - water supply tanks
 - fire pump sets
 - detection and warning systems, including:
 - emergency warning and intercommunications systems (EWIS)
 - fire detection and alarm systems
 - smoke control systems
 - emergency lighting systems
- purpose and operation of fire systems, including:
 - layout
 - system operation
 - performance requirements
 - maintenance standards
 - system activation and operation
- passive fire safety elements:
 - identification of passive elements
 - impact of fire systems design on passive elements

REQUIRED SKILLS AND KNOWLEDGE

- specifications required to safeguard integrity of passive fire element performance where penetrations are necessitated by the fire systems design
- characteristics and limitations of products and materials used in fire systems and issues relating to material compatibility
- interconnection of fire systems, including:
 - cause and effect matrix
 - interface with other services
- basic principles of structural engineering
- characteristics of building materials
- construction industry terminology
- roles and responsibilities of relevant building project personnel, including:
 - architect
 - lead contractor
 - mechanical engineer
 - hydraulic engineer
 - electrical engineer
- on-site issues that can arise during the construction phase and impose changes to the designs of fire systems and other services
- installation methods, including:
 - access requirements
 - health and safety requirements
- fluid mechanics and hydraulics relating to:
 - water supply
 - pressure
 - pump selection
 - tank selection
 - pressure vessels
 - pipe range
- sustainability requirements and ratings, including:
 - energy conservation
 - water conservation

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

EVIDENCE GUIDE
Assessment Guidelines for the Training Package.

EVIDENCE GUIDE**Overview of assessment**

This unit of competency could be assessed in the workplace or a close simulation of the workplace environment, provided that the simulated or project-based assessment fully replicates workplace conditions, materials, activities, responsibilities and procedures.

This unit could be assessed as an activity involving the establishment of the detailed design requirements of a range of fire systems design projects, including discretionary client requirements. The activity should also include researching and interpreting the specifics of applicable legislation, regulatory processes and relevant codes and standards for a range of types of buildings in different project locations.

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 required skills and knowledge specified within this unit.

In particular the person should demonstrate:

- an ability to interpret the detailed requirements of fire systems design specifications
- an understanding of the extent of compliance requirements and procedures to which fire systems design projects are subject, for a range of projects, including:
 - low-rise buildings
 - medium-rise buildings
 - high-rise buildings (over 25 metres)
 - buildings over 45 metres in height
- the ability to discern mandatory and discretionary requirements and to research the detailed compliance requirements for a range of fire systems design projects in different locations
- the ability to gather, research and interpret information that may differ in only the slightest of details from one design or location to another
- the ability to present research findings to relevant stakeholders and conduct negotiations regarding detailed design changes imposed by:

EVIDENCE GUIDE	
	• compliance requirements • detailed designs of other services • aesthetic requirements.
Context of and specific resources for assessment	Assessment of essential underpinning knowledge may be conducted in an off-site context. It is to comply with relevant regulatory or Australian standards' requirements. Resource implications for assessment include: • design briefs, drawings, plans and specifications • copies of codes, standards, legislation and regulatory requirements • access to information and communications technology hardware and software.
Method of assessment	Assessment 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.
Guidance information for assessment	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. 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.

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.

Fire systems may include:

- water-based systems, including:
 - wet pipe sprinkler systems
 - deluge and drencher systems
 - dry pipe sprinkler systems
 - pre-action sprinkler systems
 - early suppression fast response (ESFR)
 - hydrants, hose reels and monitors
- detection and warning systems, including:
 - emergency warning and intercommunications systems (EWIS)
 - fire detection and alarm systems
 - smoke control systems
 - emergency lighting systems.

Engineered or innovative solutions may include those defined in the Building Code of Australia as:

- 'solutions which comply with the Performance Requirements other than by reason of satisfying the Deemed-to-Satisfy Provisions'.

Relevant drawings, plans and schedules for the building project may include:

- drawings, including:
 - architectural
 - structural
 - mechanical
 - hydraulic
 - electrical
 - layout
 - section
 - detail
 - external references
- project plan
- project schedule
- design brief
- design specifications.

RANGE STATEMENT	
Legislation may include:	• international, state and territory, or local legislation relevant to various sites of major fire systems design projects and impacting on detailed designs for specific locations.
Regulatory requirements may include:	• mandatory requirements • design approval • fire brigade requirements • certification of installation • infrastructure supply regulations.
Codes and standards may include:	• the Building Code of Australia • the Plumbing Code of Australia • Australian standards for fire systems • international standards for fire systems • other fire system standards commonly required by building insurers.
Types of buildings and situations may include:	• different types of buildings, including: • residential • commercial • industrial • mixed classification • buildings in different locations, including: • local • involving more than one state or territory • international • classifications of buildings in the Building Code of Australia: • occupancy classes • multiple classifications • parts with more than one classification • fire hazard properties of materials and smoke growth rate • classifications of buildings specified in relevant Australian or international standards • classifications of buildings relating to standards or codes applied by building insurers.

Unit Sector(s)

Unit sector	Fire systems design
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Co-requisite units

Co-requisite units	Nil
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Competency field

Competency field	
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